3

Bartram & Sons. Ltd

Yard No. 301-2-3-4

Profile.

SUNDERLAND RPT. NO. 34 144

Empire Mauritius.

SUNDERLAND RPT. NO. 34207

"Empire Aden"

SUNDERLAND RPT. NO. 34323.

Empire Tobago.

" "

MADDA BOZZO *

EX

'GRYFEVALE'

M/N KRISS

C

015213-015223-0208

14 FEB 1944

S.S. Nº 301.

P.F. (C) TYPE VESSEL.

PROFILE.

SCALE :- 1/8" = 1 FOOT

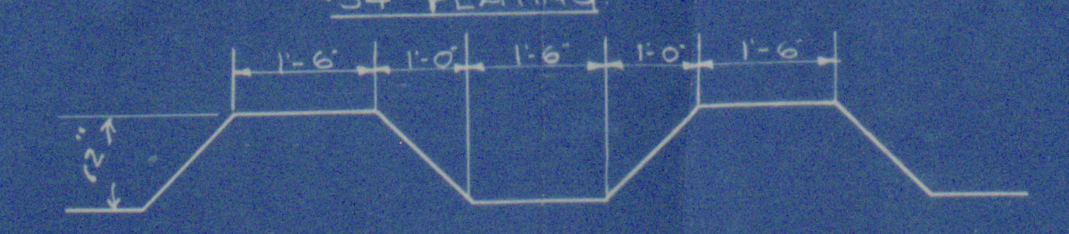
CLASS 100 A1. WITH FREEBOARD CORRESPONDING TO DRAUGHT EXTREME 26'-9"

DIMENSIONS.	
LENGTH B.P. ON L.W.L.	425'-0"
BREADTH MOULDED.	56'-0"
BREADTH EXTREME	56'-3"
DEPTH MOULDED 2ND DECK (FLAT SHEER)	27'-3"
DEPTH MOULDED UPPER DECK (" ")	38'-0"

THE SCANTLINGS OF BULB ANGLE & CHANNEL SECTIONS GIVEN ON THIS PLAN ARE N.B.S.

DETAIL SHOWING TROUGHED PLATES FOR TRANSVERSE W.T. BULKHEADS ON FRS 52, 75, 25 & 121 & NON W.T. BULKHD ON FR. 68. IN HOLDS.

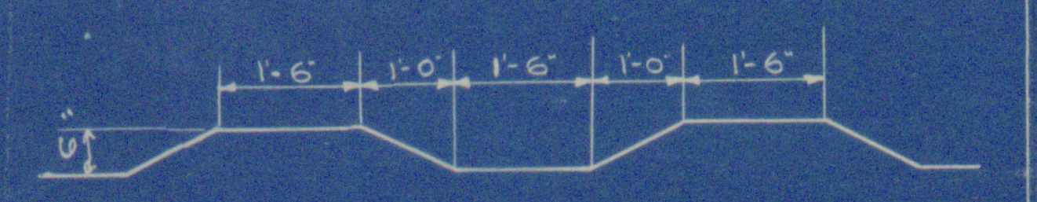
·34" PLATING



1'-6"
1'-0"
1'-6"
1'-0"
1'-6"
12"

DETAIL SHOWING TROUGHED PLATES FOR TRANSVERSE W.T. BULKHEADS ON FRS 52, 75, 96 & 118 IN TWEEN DKS.

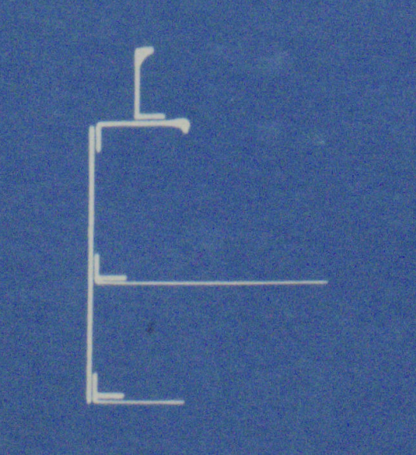
·26" PLATING



1'-6"
1'-0"
1'-6"
1'-0"
1'-6"
6"

X See plan of Hatchways

SECTION A-A THRO' UPPER DECK HATCH SIDE.



E&B CASINGS ·25" COAMING ·30" WHERE PROTECTED
" " " ·30" " ·35 " EXPOSED
STIFFRS. 3"x3"x·35" SPACED 36" APART
FORECASTLE BULKHD PLATING ·30" COAMING ·30" STIFFRS 4"x3"x5/16" O.A 30" APART
ACCOMMODATION
STEERING GEAR
MAGZE
W.T. FLAT
30" W.P.
RUDDER TRUNK
SIDE STRINGER
SIDE STR.
W.T. BULKHD TO 2ND DECK
TRUNK TO TUNNEL
AFT PEAK TANK
TUNNEL RECESS
TUNNEL WELL
STERN FRAME & RUDDER WILL BE SUBMITTED.
PEAK FLOORS ·42" S.R. LAP ON FRAMES
AFTER PEAK WILL BE SUBMITTED
GIRDER 15"x·44" 6"x3½"x·50" O.A. FACE BAR WITH 12"x1·0" RIDER
NO HATCH COAMING
GIRDER 12"x3½"x3½"x 50/50 CHANNEL WITH 8"x·50" RIDER
6"x3"x·44" B.A. STIFFRS. SPACED 30" APART. PLATING AS SHOWN.
3½"x3"x·34" REVERSE ANGLES ON ALTERNATE STIFFRS. IN WAY OF TANK (3½ TO STIFFR) (TO BE CONSIDERED WITH PLAN OF TANK)
C.L. BHD.
W.T. BHD TO UPPER DK.
DOUBLE 9"x3"x·38" B.As
Double 8x3x3/8 [fitted
Fitted 6x3x3/8 [double
DOUBLE 7"x3"x3/8" B.As AT HATCH ENDS THROUGHOUT.
·33" CURVED PLATING INCREASED ·10" UNDER HATCHES
·39 ·40" SIDE PLATING STIFFRS 4"x3"x·36" O.A. FOR SHAFT TUNNEL. 5'·0" FLAT SIDE WELDED TOE ON. SPACED 36" APART.
WATER BALLAST TANK AT TUNNEL SIDES & UNDER
THRUST RECESS
WATER BALLAST TANK
W.T.F.
COAL SHOOT
ENGINE SPACE
WATER BALLAST SIDE TANKS
BOILER SPACE
POCKET BUNKER
NON W.T. BHD. TO SECOND DK.
LINE OF TANK SIDE BKTS.
CABIN STORE
DOUBLE 11"x3½"x·40" B.As
Double 10x3½x3/8 [fitted
W.T. BHD TO SECOND DK.
DOUBLE 7"x3"x·38" B.As AT HATCH ENDS THROUGHOUT.
GIRDER 15"x·44" 6"x3½"x·50" O.A. FACE BAR WITH 18"x1·0" RIDER
Double 10x3½x·50 [fitted
WATER BALLAST SIDE TANKS
SIDE SHELL INCREASED
FO'CSLE DK.
2.6"x3½"x·50 O.A.
C.R. ROW OF PILLARS 2¾" DIA.
UPPER DK.
CHAIN LOCKER
LADDER
W.T. HATCH.
W.T. FLAT.
UPPER FORE PEAK.
30" W.P.
·30" WASH PLATE
SIDE STRINGER
FORE PEAK TANK
4"x4"x·50"
side stringer
ALTERNATIVELY - PILLARS FORMED OF 3½"x3½"x3/8" ANGLES LUGGED.
Plating ·30 Stiffeners 6+3+·40L inverted 24" spacing " 3½+3+·34L " 24" "
PEAK FLOORS ·42" S.R. LAP ON FRAMES.
F.P. Bhd (Fitted) Frame 144 Plating ·53-·40 Stiffeners 9+3½+·41[spaced 24" 8+3+·50[—"— 6+3+·42-·30[—"—
H F D B 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104 106 108 110 112 114 116 118 120 122 124 126 128 130 132 134 136 138 140 142 144 146 148 150 152 154 156

24" FRAME SPACING | 30" | 36" FRAME SPACING | 3/5 L. | 1/2 L. | 1/2 L. | 36" FRAME SPACING | 3/5 L. | 27" FRAME SPACING | 27" FRAME SPACING | 24" FRAME SPACING

PEAK FRAMES 8"x3½"x·35 B.A.

W.T. Bhd No 9. (as fitted)
Plating ·50, ·15, ·30
Stiffening 6+3+·50-·36 [spaced 24"
4+3+·36L —"—
3½+3+·30L —"—

MAIN FRAMES 10"x3½"x·48 B.As SCARPHED TO FLOORS.

MAIN FRAMES 12"x3½"x5/8" B.As

MAIN FRAMES 12"x3½"x·68" B.As

MAIN FRAMES 12"x3½"x5/8" B.As

PEAK FRAMES 8"x3½"x·35 B.A. TO UPPER & FO'C'LE DKS ALTERNATELY INTERMEDIATE FRAMES IN FO'C'LE. 5"x3"x5/16" O.A. WELDED TO UPPER DECK

INTERMEDIATE FRAMES. 5"x3½"x·35 O.A. WELDED TO SECOND DECK.

INTERMEDIATE FRAMES 6"x3½"x·44 O.As WELDED TO SECOND DECK

INTERMEDIATE FRAMES 8"x3½"x·35" B.As WELDED TO SECOND DECK.

MAIN FRAMES CARRIED UP TO UPPER DECK AT FRAMES MARKED LX (IN WAY OF CANTILEVER BEAMS & UPPER DECK TWIN HATCH END BEAMS).

SUNDERLAND 30 4/2/44

Bartram & Sons, Ltd

Yard No. 301

Midship Section Riveting.

SUNDERLAND RPT. NO. 34207

"Empire Aden".

②

SUNDERLAND RPT. NO. 34323.

Empire Tobago.

N/N NORTHERN VENTURE

D/S 649

010631 - 010639 - 0140

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Lloyd's Register Foundation

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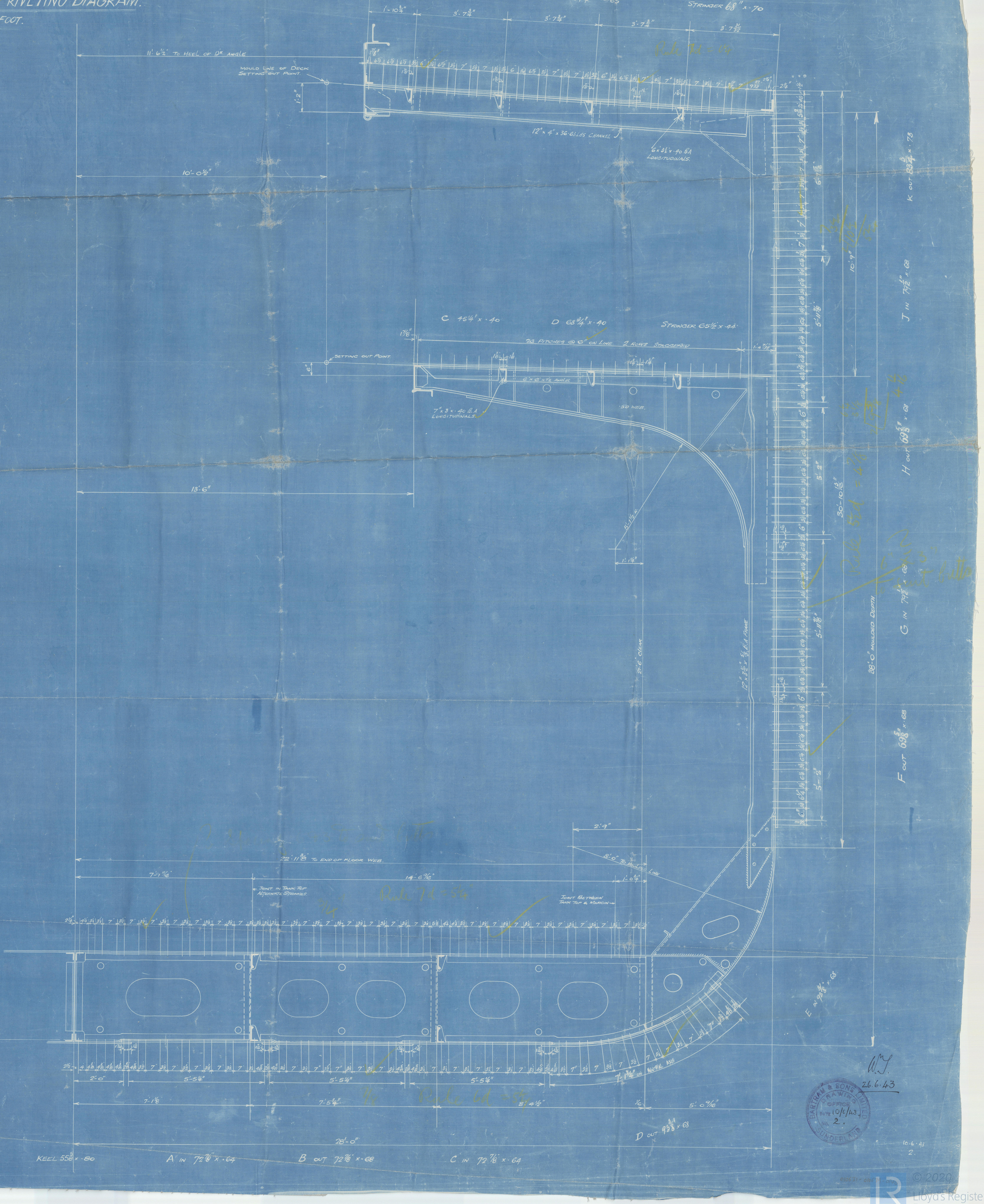
SHIP Nº 301

MIDSHIP SECTION RIVETING DIAGRAM.

SCALE 3/4" = 1 FOOT.


C 66" × ·70
D 69¼" × ·65
STRINGER 68" × ·70
1'-10¾"
3'-7¾"
3'-7¾"
3'-7¾"
3'-7 31/32
11'-6½" TO HEEL OF DK ANGLE
MOULD LINE OF DECK SETTING OUT POINT.
1'-2"
12" × 4" × 36·63 LBS CHANNEL
6 × 3½ × ·40 B.A LONGITUDINALS.
Rule 7d = 5¼
10'-0½"
C 45¼" × ·40
D 68¾" × ·40
STRINGER 65½ × ·44
26 PITCHES @ 6" ON LINE 2 ROWS STAGGERED
1'-4 7/32"
1⅞"
SETTING OUT POINT.
6"
6" × 6" × ½ ANGLES.
7" × 3" × ·40 B.A LONGITUDINALS.
·50 WEB.
13'-6"
6'-7 15/16"
10'-9"
5'-11⅞"
5'-2"
30'-10 13/16"
Rule 5¼d = 4 7/16
38'-0" MOULDED DEPTH
12" × 3½" × 5/8 B.A FRAME
21'-6" CLEAR
K OUT 83¾ × ·73
J IN 79½" × ·68
H OUT 69⅝" × ·68
G IN 79½" × ·68
F OUT 69⅝" × ·68
E IN 93⅜" × ·68
2'-9"
8'-0" TO MOULDED LINE
72'-11⅜" TO END OF FLOOR WEB.
7'-1 11/16"
14'-6 9/16"
1'-0¾"
JOINT IN TANK TOP ALTERNATE STRAKES.
Rule 7d = 5¼"
JOINT BETWEEN TANK TOP & MARGIN
7'-1¾" ON NEUTRAL AXIS
2'-0"
5'-5¼"
5'-5¼"
5'-5¼"
7'-1⅛"
7'-5¾"
8'-4½"
5'-0 9/16"
Rule 6d = 5¼
28'-0"
D OUT 93⅜" × ·68
KEEL 55⅝ × ·80
A IN 72 7/8" × ·64
B OUT 72 7/8" × ·68
C IN 72 7/8" × ·64

W.J.
26.6.43

BARTRAM & SONS LIMITED
DRAWING OFFICE
DATE 10/6/43
NO. 2.
SUNDERLAND

10·6·43
2.

010631 - 010639 - 0140

(2)

Bartram & Sons. Ltd.

Yard No. 301-2-3-4

Midship Section.

SUNDERLAND RPT. NO. 34144

"Empire Mauritius"

SUNDERLAND RPT. NO. 34207.

"Empire Aden".

SUNDERLAND RPT. NO. 34323.

Empire Tobago.

EX
Crowborough Hill

NOW

GRYFEVALE

N/N KRISS

015213-015223-0207

SHIP No ~~301~~ 303
P.F. (C) TYPE VESSEL.
MIDSHIP SECTION.

26 JUN 1943

SCALE ½" = 1 FOOT

CLASS 100 A1 WITH FREEBOARD CORRESPONDING TO DRAUGHT EXTREME 26'·9"

DIMENSIONS.

LENGTH B.P. ON L.W.L.	425'-0"
BREADTH MOULDED	56'-0"
" EXTREME	56'-3"
DEPTH MOULDED 2ND DECK (FLAT SHEER)	27'-3"
" " UPPER " (" ")	38'-0"

NUMERALS.

1ST. LONGTL NUMBER L × D = 425·0' × 37 = 15,725
2ND. " " L(B+D) = 425 (56·0 +37) = 39,525.
L/D TO UPPER DECK = 425·0 ÷ 38·0 = 11·18
D (MOULDED DEPTH) = 37
d = 38' - (10'·9" + 3'·7¼") - CREDIT FOR DEEPER KNEES & FRAME BKT. = 21·83'

EQUIPMENT NUMBER. (NORMAL SHEER)

2ND. LONGTL. NUMBER L(B+D) = 425 (56+37) = 39,525
FORECASTLE 38·0 × 6·75 × ·75 = 192
MIDSHIP DECKHOUSE 96 × 7·5 × ·50 = 360
RAISED UPPER DECK AFT 34 × 3 × ·75 = 77
EQUIPMENT NUMBER = 40,154

EQUIPMENT

× See letter × 2 BOWER ANCHORS 68 CWTS EACH STOCKLESS
1 STREAM " 19 " EX STOCK
× 225 FATHOMS 2 5/16 STUD CHAIN CABLE 600 CWTS
90 " 1 5/16" STREAM CHAIN OR 5" FLEXIBLE WIRE 6 × 12
120 " 4¾" SPECIAL FLEXIBLE STEEL WIRE 6 × 24
2 HAWSERS 90 FATHOMS 8" HEMP OR 2¾" FLEXIBLE STEEL WIRE 6 × 12
2 WARPS 90 " 7" " " 2½ " " "

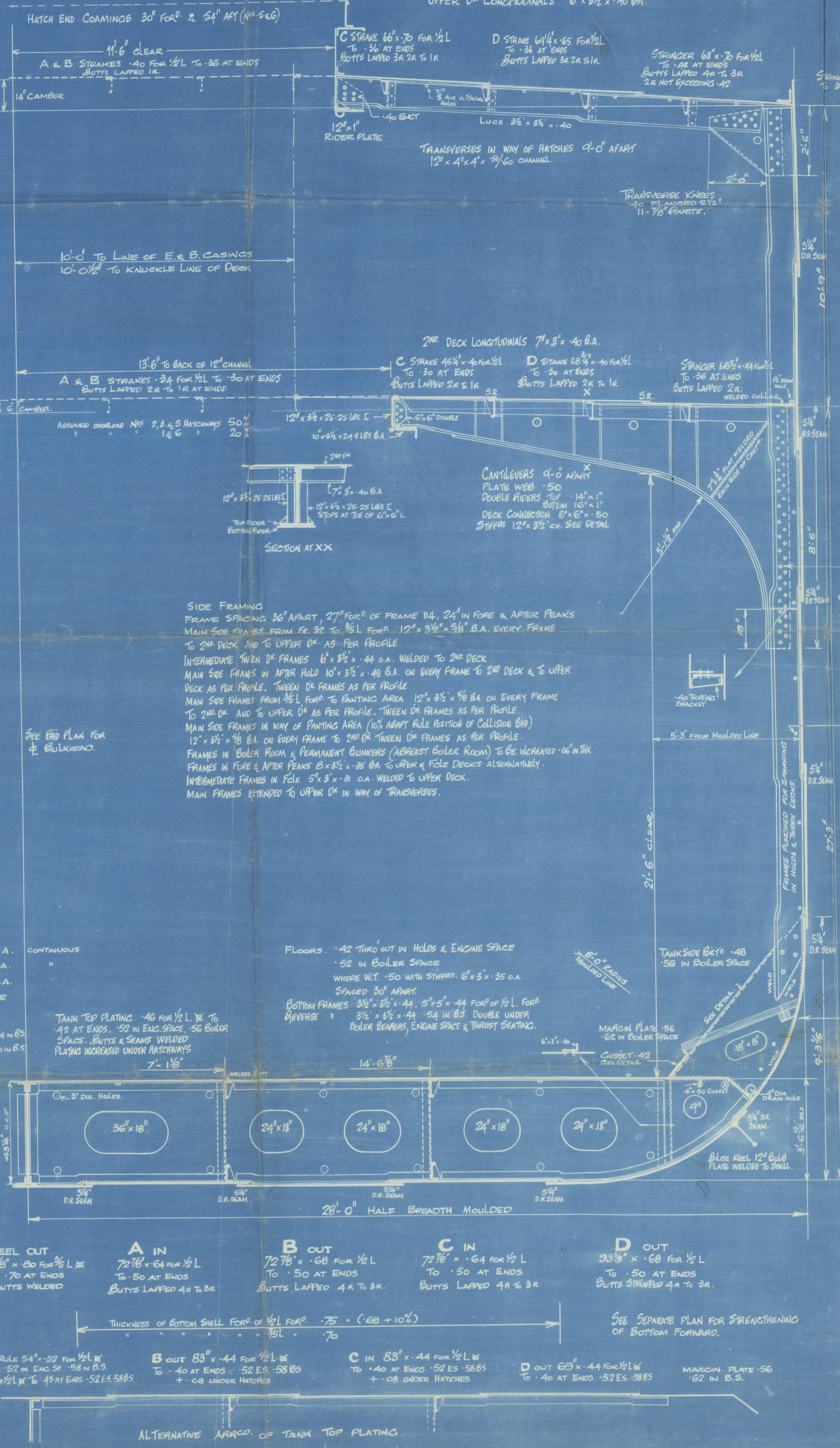
RIVETING.

RIVETS IN FRAMES TO FLOORS AND CROSS TIE PLATES IN AFTER PEAK	SPACED 5 DIAS.	
" " " " SHELL AT FLAT OF BOTTOM FORD. OF ½ L FORD.	" 5½ "	(TWO COMPLETE ROWS)
" " " " FLOORS " " " " " " "	" " "	" "
" SIDE FRAMES TO SHELL IN WAY OF 36" FRAME SPACING	" " "	
" " " " " " " " PANTING AREA & FORE & AFTER PEAKS	" " "	
" BOTTOM FRAMES TO SHELL AFT OF ½ L. FORWARD & IN WAY OF 36" SPACING	" 6 "	
" 3 R BUTTS OF OUTSIDE PLATING & OF DECK STRINGER PLATES	" 3½ "	
" 4 R " " " " " " " "	" 4 "	
" SEAMS OF SHELL PLATING, DECK PLATING AS PER TABLE 40		
" BUTTS OF DECK PLATING	" 4 "	
" SEAMS OF BULKHD. PLATING, WEATHER DK STRINGER ANGLES & BHD FRAME TO BHD	" 4½ "	
" FLAT KEEL ANGLES, VERTICAL ANGLES CONNECTING FLOORS TO C.G. AND SHELL FLANGE OF W.T. BULKHD. FRAME	" 5 "	
" FRAMES TO FLOORS AFT OF ½ L. FORD, REVERSE FRAMES TO FLOORS & INNER BOTTOM PLATING, VERTICAL ANGLES TO FLOORS & SIDE GIRDERS, IN BHD STIFFRS (EXCEPT PEAK BULKHDS) AND IN DECK PLATING TO BEAMS	" 7 "	
" CR. GIRDER TOP ANGLES (NON - WATERTIGHT)	" 7 "	
" " " " " (WATERTIGHT)	" 5 "	

THE SCANTLINGS OF ANGLE & BULB ANGLE SECTIONS GIVEN ON THIS PLAN ARE N.B.S.

SIDE GIRDERS. IN HOLDS. SHELL BAR 7" × 3½" × ·42 B.A. CONTINUOUS
" TANK TOP BAR 7" × 3" × ·42 B.A. "
" VERTICALS 7" × 3" × ·42 B.A.
SIDE GIRDERS WHERE PLATE FITTED ·42 IN ENGINE SPACE
·52 " BOILER "
BOTTOM BARS 3½" × 3" × ·44
TOP BARS 3" × 3" × ·44 ·54 IN B.S.
VERTICALS 3" × 3" × ·40 ·50 IN B.S.

CENTRE GIRDER. 43¼" × ·54 FOR ½ L AMIDSHIPS
·46 AT ENDS. ·62 BOILER SPACE. BUTTS WELDED
VERTICALS 3½" × 3½" × ·44 SINGLE, ·54 IN B.S.
" 5" × 5" × ·44 SINGLE UNDER ENGINES & THRUST AND AT BOILER BEARERS.
TOP BARS 3½" × 3½" × ·48 FOR ½ L TO ·44 AT ENDS
·58 IN BOILER SPACE
BOTTOM BARS 4" × 4" × ·54 FOR ½ L TO ·50 AT ENDS.

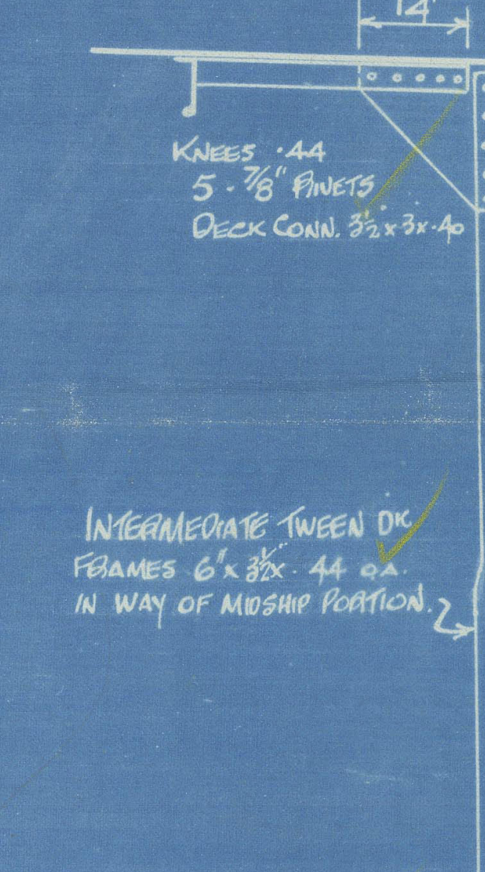

DECK PLATING INCREASED, PER CIRCULAR 972/42.
UPPER DK LONGITUDINALS 6" × 3½" × ·40 B.A.
HATCH END COAMINGS 30" FORD. & 54" AFT (NOS. 5 & 6)
11'·6" CLEAR
A & B STRAKES ·40 FOR ½ L TO ·36 AT ENDS BUTTS LAPPED 1R.
C STRAKE 66" × ·70 FOR ½ L TO ·36 AT ENDS BUTTS LAPPED 3R 2R TO 1R
D STRAKE 69¼" × ·65 FOR ½ L TO ·36 AT ENDS BUTTS LAPPED 3R 2R TO 1R
STRINGER 68" × ·70 FOR ½ L TO ·42 AT ENDS BUTTS LAPPED 4R TO 3R 2R NOT EXCEEDING ·42.
STRINGER ANGLE 6" × 6" × ·68 FOR ½ L TO 3½" × 3½" × ·42 AT ENDS.
14" CAMBER
7/8" AIR & STAGING HOLES
·40 BKT
12" × 1" RIDER PLATE
LUGS 3½" × 3½" × ·40
TRANSVERSES IN WAY OF HATCHES 9'-0" APART 12" × 4" × 4" × ·50/·60 CHANNEL.
2'-6"
2'-0"
TRANSVERSE KNEES ·40 FLANGED 2½" 11 - 7/8" RIVETS.
11'-5" HEEL OF BEAMS
10'-0" TO LINE OF E. & B. CASINGS
10'-0½" TO KNUCKLE LINE OF DECK
5¼" D.R. SEAM
10'·9"
2ND. DECK LONGITUDINALS 7" × 3" × ·40 B.A.
13'·6" TO BACK OF 12" CHANNEL
A & B STRAKES ·34 FOR ½ L TO ·30 AT ENDS BUTTS LAPPED 2R TO 1R AT ENDS.
C STRAKE 45¼" × ·40 FOR ½ L TO ·30 AT ENDS BUTTS LAPPED 2R TO 1R
D STAKE 68¾" × ·40 FOR ½ L TO ·30 AT ENDS BUTTS LAPPED 2R TO 1R
STRINGER 65½" × ·44 FOR ½ L TO ·36 AT ENDS BUTTS LAPPED 2R.
1½" DRAIN HOLE
WELDED COLLAR
S.R.
S.R.
X
6" CAMBER.
ASSUMED OVERLOAD NOS 2, 3, & 5 HATCHWAYS 50%
" " 1 & 6 " 20%
12" × 3½ × 25·25 LBS [
6" × 6" DOUBLE
10" × 3½ × 24·8 LBS B.A.
2ND DK
7" × 3" × ·40 B.A.
12" × 3½" × 25·25 LBS [
12" × 3½ × 25·25 LBS [STOPS AT TOE OF 6" × 6" L
TOP RIDER
BOTTOM RIDER
SECTION AT XX
X
CANTILEVERS 9'-0" APART
PLATE WEB ·50
DOUBLE RIDERS TOP 14" × 1"
BOTTOM 16" × 1"
DECK CONNECTION 6" × 6" × ·50
STIFFRS 12" × 3½" CH. SEE DETAIL
7" × ¾" FLAT WELDED EACH SIDE OF CANTR.
5'-1½" RAD.
8'·6"
5¼" D.R. SEAM
38'-0"
18"
·40 TRIPPING BRACKET
40 7/8" DIA RIVETS
5'-3" FROM MOULDED LINE
15/16" DIA. AIR HOLES.
SEE END PLAN FOR £ BULKHEAD.
21'-6" CLEAR
FRAMES PUNCHED FOR SPARRING IN HOLDS & TWEEN DECKS.
5¼" D.R. SEAM
27'-3"
TANK SIDE BKTS ·48 ·58 IN BOILER SPACE
8'-0" RADIUS MOULDED LINE
WELD
WELD
SEE DETAIL 1
BRACKET SLOTTED & 4" × ½" FLAT WELDED IN TO TAKE CEILING BEARER.
9'-3 1/16"
MARGIN PLATE ·56 ·62 IN BOILER SPACE
6" × 3" × ·40
GUSSET ·42 SEE DETAIL
18" × 8"
4" × ·50 GUSSET
9"
4" DIA DRAIN HOLE
5¼" D.R. SEAM.
3'-6 9/16" MLD
BILGE KEEL 12" BULB PLATE WELDED TO SHELL.
7'-1⅛"
WELDED BUTT
14'-6⅞"
3" DIA. HOLES.
36" × 18"
24" × 18"
24" × 18"
24" × 18"
24" × 18"
43¼" H.O.B.
5¼" D.R. SEAM
5¼" D.R. SEAM
5¼" D.R. SEAM
5¼" D.R. SEAM
28'-0" HALF BREADTH MOULDED
D
E

TANK TOP PLATING ·46 FOR ½ L ~~X~~ TO ·42 AT ENDS. ·52 IN ENG. SPACE, ·56 BOILER SPACE. BUTTS & SEAMS WELDED PLATING INCREASED UNDER HATCHWAYS

FLOORS. ·42 THRO' OUT IN HOLDS & ENGINE SPACE
·52 IN BOILER SPACE
WHERE W.T. ·50 WITH STIFFRS. 6" × 3" × ·35 O.A. SPACED 30" APART.
BOTTOM FRAMES 3½" × 3½" × ·44, 5" × 5" × ·44 FORD OF ½ L. FORD.
REVERSE " 3½" × 3½" × ·44 ·54 IN B.S. DOUBLE UNDER BOILER BEARERS, ENGINE SPACE & THRUST SEATING.

SIDE FRAMING
FRAME SPACING 36" APART, 27" FORD. OF FRAME 114, 24" IN FORE & AFTER PEAKS
MAIN SIDE FRAMES FROM FR. 32 TO 3/5 L FORD. 12" × 3½" × 5/8" B.A. EVERY FRAME TO 2ND. DECK AND TO UPPER DK. AS PER PROFILE
INTERMEDIATE TWEEN DK. FRAMES 6" × 3½" × ·44 O.A. WELDED TO 2ND. DECK
MAIN SIDE FRAMES IN AFTER HOLD 10" × 3½" × ·48 B.A. ON EVERY FRAME TO 2ND DECK & TO UPPER DECK AS PER PROFILE. TWEEN DK FRAMES AS PER PROFILE
MAIN SIDE FRAMES FROM 3/5 L FORD. TO PANTING AREA 12" × 3½" × 5/8 BA ON EVERY FRAME TO 2ND. DK. AND TO UPPER DK AS PER PROFILE. TWEEN DK FRAMES AS PER PROFILE.
MAIN SIDE FRAMES IN WAY OF PANTING AREA (10% ABAFT RULE POSITION OF COLLISION BHD) 12" × 3½" × 5/8 B.A. ON EVERY FRAME TO 2ND DK TWEEN DK FRAMES AS PER PROFILE.
FRAMES IN BOILER ROOM & PERMANENT BUNKERS (ABREAST BOILER ROOM) TO BE INCREASED ·06" IN THK
FRAMES IN FORE & AFTER PEAKS 8" × 3½" × ·35 BA TO UPPER & FCLE DECKS ALTERNATIVELY.
INTERMEDIATE FRAMES IN FCLE 5" × 3" × ·31 O.A. WELDED TO UPPER DECK.
MAIN FRAMES EXTENDED TO UPPER DK IN WAY OF TRANSVERSES.

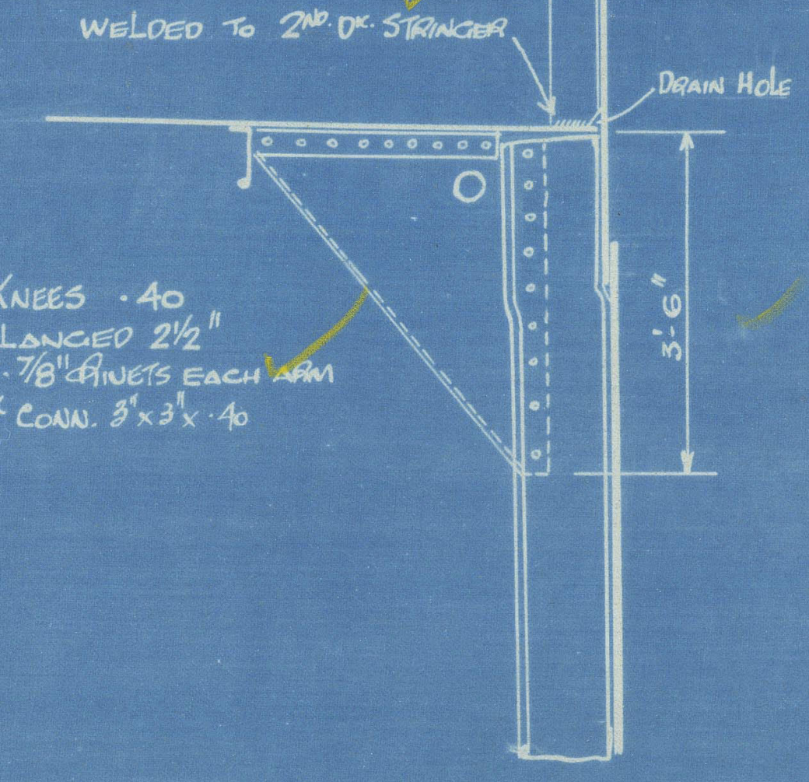
FORECASTLE
STRINGER PLATE 35" × ·36 BUTTS 1R.
" ANGLE 3½" × 3½ × ·36
DECK PLATING ·32 UNSHEATHED. BUTTS LAPPED 1R.
SIDE PLATING ·40 SEAMS & BUTTS 1R
BEAMS EVERY FRAME AS PER DECK PLAN.


14"
18"
KNEES ·44 5 - 7/8" RIVETS DECK CONN. 3½ × 3 × ·40

K OUT
83¾" × ·73 FOR ½ L
TO ·46 AT ENDS
BUTTS LAPPED 4R TO 3R AT ENDS.

INTERMEDIATE TWEEN DK FRAMES 6" × 3½" × ·44 O.A. IN WAY OF MIDSHIP PORTION.

J IN
79½" × ·68 FOR ½ L
TO ·46 AT ENDS
BUTTS LAPPED 3R.

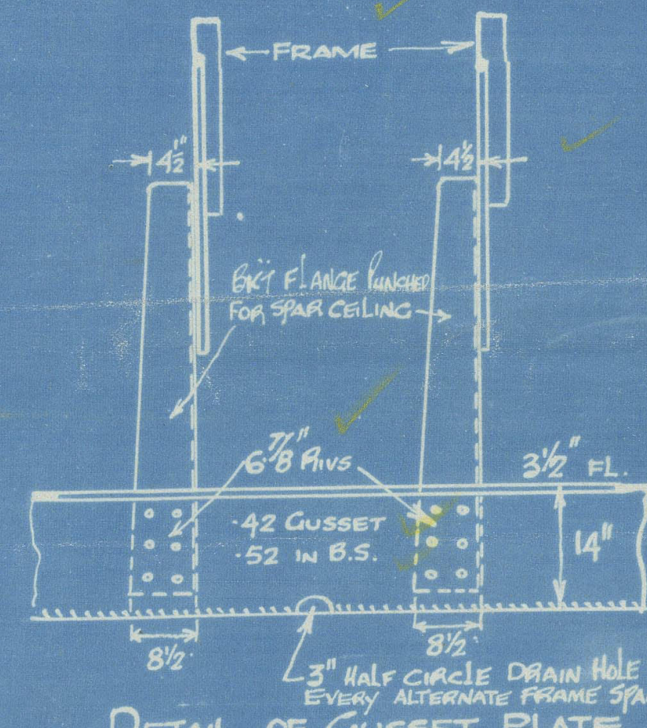

WELDED TO 2ND. DK. STRINGER
DRAIN HOLE
KNEES ·40 FLANGED 2½" 9 - 7/8" RIVETS EACH ARM DK CONN. 3" × 3" × ·40
3'·6"

H OUT
69⅝" × ·68 FOR ½ L.
TO ·46 AT ENDS
BUTTS LAPPED 3R.

G IN
79½" × ·68 FOR ½ L.
TO ·46 AT ENDS
BUTTS LAPPED 3R.

F OUT.
69⅝" × ·68 FOR ½ L
TO ·46 AT ENDS
BUTTS LAPPED 3R.

E IN
93⅜" × ·68 FOR ½ L.
TO ·50 AT ENDS
BUTTS STRAPPED


FRAME
4½
4½
BKT FLANGE PUNCHED FOR SPAR CEILING
7/8" 6 - 7/8 RIVS
3½" FL.
·42 GUSSET ·52 IN B.S.
14"
8½
8½
3" HALF CIRCLE DRAIN HOLE EVERY ALTERNATE FRAME SPACE.

DETAIL OF GUSSET PLATE.

KEEL OUT	**A** IN	**B** OUT	**C** IN	**D** OUT
55⅝" × ·80 FOR 3/5 L ~~X~~	72⅞" × ·64 FOR ½ L	72⅞" × ·68 FOR ½ L	72⅞" × ·64 FOR ½ L	93⅜" × ·68 FOR ½ L
TO ·70 AT ENDS	TO ·50 AT ENDS	TO ·50 AT ENDS	TO ·50 AT ENDS	TO ·50 AT ENDS
BUTTS WELDED	BUTTS LAPPED 4R TO 3R	BUTTS LAPPED 4R TO 3R.	BUTTS LAPPED 4R TO 3R	BUTTS STRAPPED 4R TO 3R.

THICKNESS OF BOTTOM SHELL FORD. OF ½ L FORD. ·75 = (·68 + 10%)
" " " " " " 3/5 L " ·70

SEE SEPARATE PLAN FOR STRENGTHENING OF BOTTOM FORWARD.

T.T. CR. STRAKE TO RULE 54" × ·52 FOR ½ L ~~X~~ TO ·44 AT ENDS ·52 IN ENG. SP. ·58 IN B.S.
FITTED 71½" × ·52 FOR ½ L ~~X~~ TO ·43 AT ENDS ·52 E.S. ·58 B.S.
B OUT 83" × ·44 FOR ½ L ~~X~~ TO ·40 AT ENDS ·52 E.S. ·58 B.S. + ·08 UNDER HATCHES
C IN 83" × ·44 FOR ½ L ~~X~~ TO ·40 AT ENDS ·52 E.S. ·58 B.S. + ·08 UNDER HATCHES
D OUT 69" × ·44 FOR ½ L ~~X~~ TO ·40 AT ENDS ·52 E.S. ·58 B.S.
MARGIN PLATE ·56 ·62 IN B.S.

ALTERNATIVE ARRGT. OF TANK TOP PLATING.

W.T.
26.6.43.

BARTRAM & SONS LIMITED
DRAWING OFFICE
DATE 10/6/43.
NO. 4
SUNDERLAND

10-6-43
1

1

GRYFEVALE

Bartram Yard No 301-2-3-4
Midships Section

Embodying fabricated material.

37606

SUNDERLAND RPT. NO. 34144

Empire Mauritius

SUNDERLAND RPT. NO. 34207.

"Empire Aden"

SUNDERLAND RPT. NO. 34323.

Empire Tobago.

CRONBURGH HILL.

N/N KRISS

015213-015223-0206

1 OCT 1943

No. 301.

P.F. (C) TYPE VESSEL.

MIDSHIP SECTION.

SCALE ½" = 1 FOOT.

CLASS 100 A1 WITH FREEBOARD CORRESPONDING TO DRAUGHT EXTREME 26'-9"

DIMENSIONS

LENGTH B.P. ON L.W.L.	425'-0"
BREADTH MOULDED	56'-0"
BREADTH EXTREME	56'-3"
DEPTH MOULDED 2ND. DECK (FLAT SHEER)	27'-3"
DEPTH MOULDED UPPER DK. (" ")	38'-0"

NUMERALS.

1ST LONGTL. NUMBER L × D = 425-0' × 37' = 15,725

2ND " " L(B+D) = 425'(56-0 + 37) = 39,525

L/D TO UPPER DECK = 425·0 ÷ 38·0 = 11·18

D (MOULDED DEPTH) = = 37

d = 38' - (10'-9" + 3'-7¼") - CREDIT FOR DEEPER KNEES & FRAME BKT 21·83'

EQUIPMENT NUMBER 40,157.

EQUIPMENT.

x See letter

- X 2 BOWER ANCHORS 68 CWTS. EACH STOCKLESS.
- 1 STREAM ANCHOR 19 " EX. STOCK.
- X 225 FATHOMS 2 5/16" STUD CHAIN CABLE 600 CWTS.
- 90 " 1 5/16 STREAM CHAIN OR 5" FLEXIBLE WIRE 6 × 12.
- 120 " 4 ¾" SPECIAL FLEXIBLE STEEL WIRE 6 × 24
- 2 HAWSERS 90 FATHOMS 8" HEMP OR 2¾" FLEXIBLE STEEL WIRE 6 × 12.
- 2 WARPS 90 " 7 " 2½" " " " 6 × 12.

RIVETING.

RIVETS IN FRAMES TO FLOORS & CROSS TIE PLATES IN AFTER PEAK SPACED 5 DIAS.

" " SHELL AT FLAT OF BOTTOM FOR ½ OF ½L FORD SPACED 5½ DIAS ([illegible])

" " FLOORS " " " " " " " 5½ " ([illegible])

" " SIDE FRAMES TO SHELL SPACED 5½ DIAS. IN WAY OF 36" SPACING.

" " " " " " " 5½ " " " " PANTING AREA & FORE & AFT PEAKS

" " BOTTOM FRAMES TO SHELL AFT OF ½L FORWARD SPACED 6 DIAS IN WAY OF 36 SPACING

" " 3R BUTTS OF OUTSIDE PLATING & OF DECK STRINGER PLATES SPACED 3½ DIAS

" " 4R " " " " " " " " " 4

" " SEAMS OF SHELL PLATING, DECK PLATING AS PER TABLE 40 IN LLOYD'S RULES.

" " BUTTS OF DECK PLATING SPACED 4 DIAS. APART C TO C.

" " SEAMS OF BULKHEAD PLATING, WEATHER DECK STRINGER ANGLES & BULKHEAD FRAME TO BULKHEAD 4½ DIAS APART

RIVETS IN FLAT KEEL ANGLES, VERTICAL ANGLES CONNECTING FLOORS TO CENTRE GIRDER & SHELL FLANGE OF W.T. BULKHEAD FRAME 5 DIAS. APART

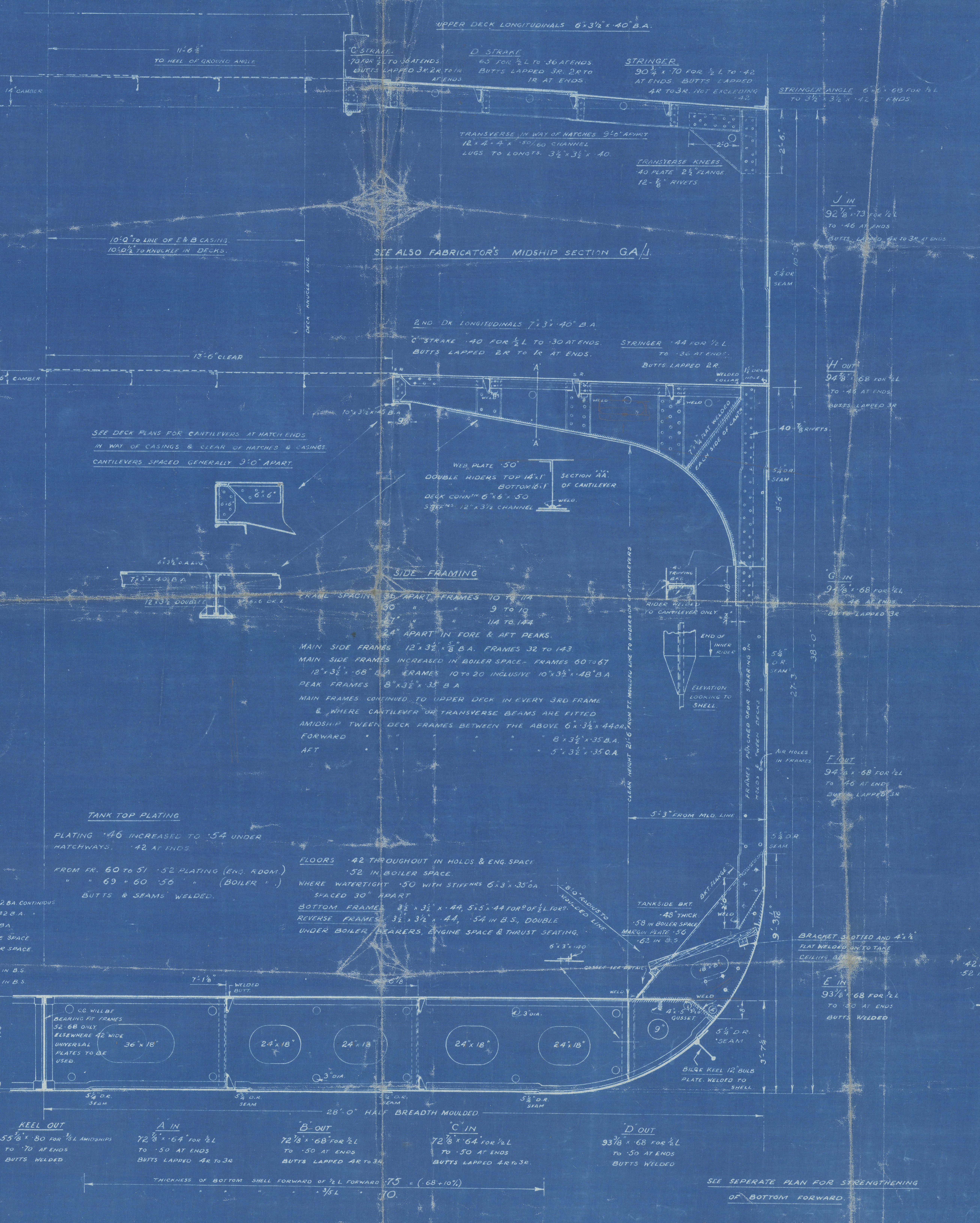
RIVETS IN FRAMES TO FLOORS AFT OF ½L FORD, REVERSE FRAMES TO FLOORS & INNER BOTTOM PLATING, VERTICAL ANGLES TO FLOORS & SIDE GIRDERS IN BULKHEAD STIFFENERS (EXCEPT PEAK BULKHEADS) AND IN DECK PLATING TO BEAMS SPACED 7 DIAS

RIVETS IN CENTRE GIRDER TOP ANGLES (NON-WATERTIGHT) SPACED 7 DIAS.

" " " " " (WATERTIGHT.) " 5 "

THE SCANTLINGS OF ANGLE & BULB ANGLE SECTIONS GIVEN ON THIS PLAN ARE N.B.S.

PARTICULARS OF WELDING
STEM, STERN FRAME & RUDDER } SEE SEPARATE PLAN.



11'-6½" TO HEEL OF GROUND ANGLE
14" CAMBER
11'-5" HEEL OF BEAMS
10'-0" TO LINE OF E & B CASING.
10'-0½" TO KNUCKLE IN DECKS.
DECK KNUCKLE LINE
13'-6" CLEAR
6" CAMBER
UPPER DECK LONGITUDINALS 6" × 3½" × ·40" B.A.
"C" STRAKE. ·70 FOR ½L TO ·36 AT ENDS. BUTTS LAPPED 3R. 2R. TO 1R. AT ENDS
D STRAKE 65 FOR ½L TO ·36 AT ENDS. BUTTS LAPPED 3R. 2R TO 1R AT ENDS.
STRINGER. 90¾" × ·70 FOR ½L TO ·42 AT ENDS. BUTTS LAPPED 4R TO 3R. NOT EXCEEDING ·42
STRINGER ANGLE 6" × 6" × ·68 FOR ½L TO 3½" × 3½" × ·42 AT ENDS.
TRANSVERSE IN WAY OF HATCHES 9'-0" APART 12" × 4" × 4" × ·50/·60 CHANNEL LUGS TO LONGTS. 3½" × 3½" × ·40.
2'-0"
2'-6"
TRANSVERSE KNEES. ·40 PLATE 2½" FLANGE. 12 - ⅞" RIVETS.
"J" IN 92⅞" × ·73 FOR ½L TO ·46 AT ENDS BUTTS LAPPED 4R TO 3R AT ENDS
10'-9"
5¼" DR. SEAM
SEE ALSO FABRICATOR'S MIDSHIP SECTION G.A./1.
2ND DK LONGITUDINALS 7" × 3" × ·40" B.A.
"C" STRAKE ·40 FOR ½L TO ·30 AT ENDS. BUTTS LAPPED 2R TO 1R AT ENDS.
STRINGER ·44 FOR ½L TO ·36 AT ENDS. BUTTS LAPPED 2R.
S.R.
WELDED COLLAR
1½" DRAIN HOLE
A
A
10" × 3½" × ·45 B.A.
9"
WELD
7" × ¾" FLAT WELDED EACH SIDE OF CANTR
40 - ⅞" RIVETS
"H" OUT 94⅝" × ·68 FOR ½L TO ·46 AT ENDS BUTTS LAPPED 3R
8'-6"
SEE DECK PLANS FOR CANTILEVERS AT HATCH ENDS IN WAY OF CASINGS & CLEAR OF HATCHES & CASINGS.
CANTILEVERS SPACED GENERALLY 9'-0" APART.
6" × 6"
6" × 6"
WEB PLATE ·50" DOUBLE RIDERS TOP 14" × 1" BOTTOM 16" × 1" DECK CONNTN 6" × 6" × ·50 STIFFRS. 12" × 3½ CHANNEL
SECTION "AA" OF CANTILEVER
6" × 3½" O.A. LUG
7" × 3" × ·40 B.A.
12 × 3½ DOUBLE
6 × 6 DK. L
·40 TRIPPING BKT.
18"
RIDER WELDED TO CANTILEVER ONLY.
¾"
END OF INNER RIDER
ELEVATION LOOKING TO SHELL.
"G" IN 94⅝" × ·68 FOR ½L TO ·46 AT ENDS BUTTS LAPPED 3R
CLEAR HEIGHT 21'-6" FROM T.T. MOULDED LINE TO UNDERSIDE OF CANTILEVERS
FRAMES PUNCHED FOR SPARRING IN HOLDS & TWEEN DECKS
AIR HOLES IN FRAMES
38'-0"
27'-3"
5'-3" FROM MLD. LINE
"F" OUT 94⅝" × ·68 FOR ½L TO ·46 AT ENDS BUTTS LAPPED 3R
BKT. FLANGE
2'-0"
WELD
9'-3 1/16"
8'-0" RADIUS TO MOULDED LINE
TANKSIDE BKT. ·48" THICK ·58 IN BOILER SPACE
MARGIN PLATE ·56 ·62 IN B.S.
6" × 3" × ·40"
GUSSET SEE DETAIL
18" × 8"
BRACKET SLOTTED AND 4" × ½" FLAT WELDED ON TO TAKE CEILING BEARERS
"E" IN 93⅜" × ·68 FOR ½L TO ·50 AT ENDS BUTTS WELDED
7'-1⅛"
WELDED BUTT
6'-8"
4" × 5" × 3½" GUSSET.
8"
9"
5¼" D.R. SEAM
3'-7¼"
BILGE KEEL 12" BULB PLATE. WELDED TO SHELL
43¼"
C.G. WILL BE BEARING FIT FRAMES 52-68 ONLY, ELSEWHERE 42" WIDE UNIVERSAL PLATES TO BE USED.
36" × 18"
24" × 18"
24" × 18"
24" × 18"
24" × 18"
3" DIA.
3" DIA.
5¼" D.R. SEAM
5¼" D.R. SEAM
5¼" D.R. SEAM
5¼" D.R. SEAM
28'-0" HALF BREADTH MOULDED

SIDE FRAMING

FRAME SPACING 36" APART FRAMES 10 TO 114
30" " " 9 TO 10
27" " " 114 TO 144
24" APART IN FORE & AFT PEAKS.

MAIN SIDE FRAMES 12" × 3½" × ⅝" B.A. FRAMES 32 TO 143.

MAIN SIDE FRAMES INCREASED IN BOILER SPACE - FRAMES 60 TO 67 12" × 3½" × ·68" B.A. FRAMES 10 TO 20 INCLUSIVE 10" × 3½" × ·48" B.A.

PEAK FRAMES 8" × 3½" × ·35 B.A.

MAIN FRAMES CONTINUED TO UPPER DECK IN EVERY 3RD FRAME & WHERE CANTILEVER OR TRANSVERSE BEAMS ARE FITTED

AMIDSHIP TWEEN DECK FRAMES BETWEEN THE ABOVE 6" × 3½" × ·44 O.A.
FORWARD " " " " " " 8" × 3½" × ·35 B.A.
AFT " " " " " " 5" × 3½" × ·35 O.A.

TANK TOP PLATING

PLATING ·46 INCREASED TO ·54 UNDER HATCHWAYS. ·42 AT ENDS.

FROM FR. 60 TO 51 ·52 PLATING (ENG. ROOM.)
" " 69 " 60 ·56 " (BOILER " .)

BUTTS & SEAMS WELDED.

FLOORS ·42 THROUGHOUT IN HOLDS & ENG. SPACE. ·52 IN BOILER SPACE.

WHERE WATERTIGHT ·50 WITH STIFFNRS 6" × 3" × ·35" O.A. SPACED 30" APART

BOTTOM FRAMES 3½" × 3½" × ·44, 5" × 5" × ·44 FORD OF ½L FORD.

REVERSE FRAMES 3½" × 3½" × ·44, ·54 IN B.S., DOUBLE UNDER BOILER BEARERS, ENGINE SPACE & THRUST SEATING.

SIDE GIRDERS - IN HOLDS SHELL BAR 7" × 3½" × ·42 B.A. CONTINIOUS
" TANK TOP BAR 7" × 3" × ·42 B.A. "
" VERTICALS 7" × 3" × ·42 B.A.

SIDE GIRDERS WHERE PLATE FITTED ·42 IN ENGINE SPACE
·52 IN BOILER SPACE.

BOTTOM 3½" × 3" × ·44
TOP 3½" × 3" × ·44, ·54 IN B.S.
VERTICALS 3" × 3" × ·40 ·50 IN B.S.

CENTRE GIRDER 43¼" × ·54 FOR ½L AMIDSHIPS, ·46 AT ENDS, ·62 BOILER SPACE, BUTTS WELDED.

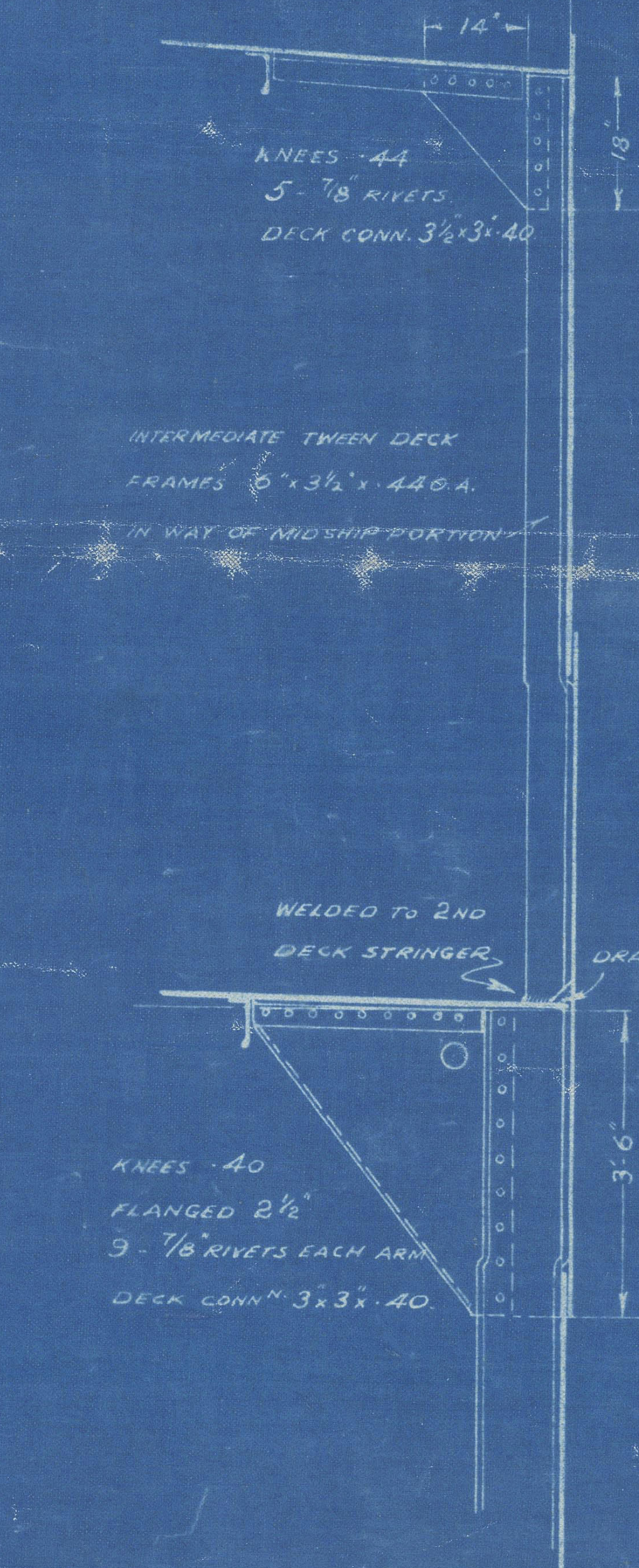
VERTICALS 3½" × 3½" × ·44 SINGLE ·54 IN B.S.
" 5" × 5" × ·44 SINGLE UNDER ENGINES, THRUST & AT BOILER BEARERS

TOP BARS 3½" × 3½" × ·48 FOR ½L TO ·44 AT ENDS ·58 IN BOILER SPACE.

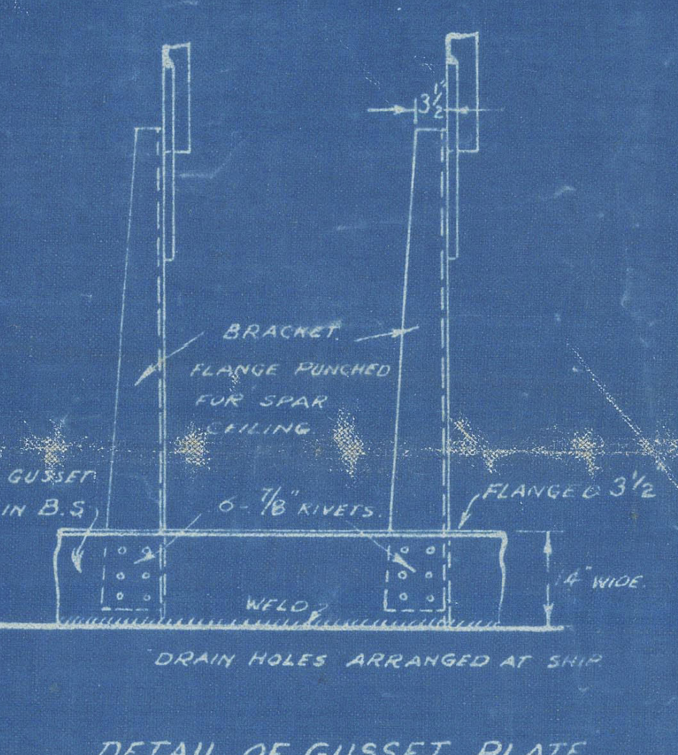
BOTTOM BARS 4" × 4" × ·54 FOR ½L TO ·50 AT ENDS

KEEL OUT	"A" IN	"B" OUT	"C" IN	"D" OUT
55⅝" × ·80 FOR ⅗L AMIDSHIPS TO ·70 AT ENDS BUTTS WELDED.	72⅞" × ·64" FOR ½L TO ·50 AT ENDS BUTTS LAPPED 4R TO 3R	72⅞" × ·68" FOR ½L TO ·50 AT ENDS BUTTS LAPPED 4R TO 3R	72⅞" × ·64" FOR ½L TO ·50 AT ENDS BUTTS LAPPED 4R TO 3R.	93⅜" × ·68 FOR ½L TO ·50 AT ENDS BUTTS WELDED

THICKNESS OF BOTTOM SHELL FORWARD OF ½L FORWARD ·75 = (·68 + 10%)
" " " " ⅗L " ·70.



14"
18"
KNEES ·44 5 - ⅞" RIVETS. DECK CONN. 3½" × 3" × ·40
INTERMEDIATE TWEEN DECK FRAMES 6" × 3½" × ·44 O.A. IN WAY OF MIDSHIP PORTION
WELDED TO 2ND DECK STRINGER
DRAIN HOLE
3'-6"
KNEES ·40 FLANGED 2½" 9 - ⅞" RIVETS EACH ARM DECK CONNN. 3" × 3" × ·40.



3½"
BRACKET. FLANGE PUNCHED FOR SPAR CEILING.
·42 GUSSET ·52 IN B.S.
6 - ⅞" RIVETS.
FLANGED 3½
4" WIDE.
WELD
DRAIN HOLES ARRANGED AT SHIP

DETAIL OF GUSSET PLATE

W.J. 1.10.43.

& SONS LIMITED DRAWING OFFICE DATE 28-9-43. NO. 49 SUNDERLAND

SEE SEPERATE PLAN FOR STRENGTHENING OF BOTTOM FORWARD.

PLAN No 37 P.F. (C)
DEPARTMENT - ADMIRALTY. D.M.B.
DATE - 24.5.43.

"Empire Tobago"
Bartram Yard No 304
Midships Section (AS FITTED)

SUNDERLAND RPT. NO. 34323.

Empire Tobago.

"Gryfevale"

N/N KRISS

015213-015223-0209

S.S. EMPIRE TOBAGO.

MIDSHIP SECTION. (AS FITTED)

SCALE ½" = 1 FOOT.

CLASS 100A1 WITH FREEBOARD CORRESPONDING TO DRAUGHT EXTREME 26'-9⅛"

DIMENSIONS

LENGTH B.P. ON L.W.L.	425'-0"
BREADTH MOULDED	56'-0"
" EXTREME	56'-3"
DEPTH MOULDED 2ND DECK (FLAT SHEER)	27'-3"
" " UPPER " (FLAT SHEER)	38'-0"

NUMERALS.

1ST LONGL NUMBER	L × D = 425'-0" × 37	= 15,725
2ND " "	L(B+D) = 425 (56-0 + 37)	= 39,525.
L/D TO UPPER DECK	= 425·0 ÷ 38-0	= 11·18.
D (MOULDED DEPTH)		= 37

d = 38'-(10'-9"+3'-7¼") - CREDIT FOR DEEPER KNEES & FRAME BKT = 21·83'

EQUIPMENT NUMBER

2ND LONGL NUMBER	L(B+D) = 425(56+37)	= 39,525
FORECASTLE	38-0' × 6·75 × ·75	= 192
MIDSHIP DECKHOUSE	96 × 7·5 × ·50	= 360
RAISED UPPER DECK AFT	34 × 3 × ·75	= 77
	EQUIPMENT NUMBER	= 40,154

EQUIPMENT

2 BOWER ANCHORS	68 CWTS	EACH	STOCKLESS
1 STREAM "	19 "	EACH	STOCK
225 FATHOMS	2 7/16" STUD CHAIN CABLE		600 CWTS.
90 "	5" FLEXIBLE WIRE 6×12		
120 "	4½" SPECIAL FLEXIBLE STEEL WIRE 6×24		
2 - HAWSERS	90 FATHOMS 2¾" FLEXIBLE STEEL WIRE 6×12		
4 WARPS	90 " 7" MANILA "		

RIVETING NOTE -

RIVETS IN FRAMES TO FLOORS AND CROSS TIE PLATES IN AFTER PEAK SPACED 5 DIAS

RIVETS IN FRAMES TO SHELL AT FLAT OF BOTTOM FORD OF ½L FORD SPACED 5½ DIAS (TWO COMPLETE ROWS)

RIVETS IN FRAMES TO FLOORS AT FLAT OF BOTTOM FORD OF ½L FORD SPACED 5½ DIAS (TWO COMPLETE ROWS)

RIVETS IN SIDE FRAMES TO SHELL IN WAY OF 36" FRAME SPACING. SPACED 5½ DIAS.

RIVETS IN SIDE FRAMES TO SHELL IN WAY OF PANTING AREA & FORE & AFTER PEAKS SPACED 5½ DIAS.

RIVETS IN BOTTOM FRAMES TO SHELL AFT OF ½L FORWARD & IN WAY OF 36" SPACING SPACED 6 DIAS

RIVETS IN TREBLE RIV. BUTTS OF OUTSIDE PLATING & OF DECK STRINGER PLATES SPACED 3½ DIAS

RIVETS IN QUAD. RIV. BUTTS OF OUTSIDE PLATING & OF DECK STRINGER PLATES. SPACED 4 DIAS.

RIVETS IN SEAMS OF SHELL PLATING, DECK PLATING AS PER TABLE 40 IN LLOYDS RULES

RIVETS IN BUTTS OF DECK PLATING SPACED 4 DIAS.

RIVETS IN SEAMS OF BULKHD PLATING WEATHER DECK STRINGER ANGLES & BULKHD FRAME TO BULKHD SPACED 4½ DIAS

RIVETS IN FLAT KEEL ANGLES VERTICAL ANGLES CONNECTING FLOORS TO C.G.
AND SHELL FLANGE OF W.T. BULKHD FRAME SPACED 5 DIAS APART.

RIVETS IN FRAMES TO FLOORS AFT OF ½L FORD REVERSE FRAMES TO FLOORS &
INNER BOTTOM PLATING VERTICAL ANGLES TO FLOORS & SIDE GIRDERS
IN BULKHD STIFFS (EXCEPT PEAK BULKHDS) & IN DECK PLATING TO BEAMS. SPACED 7 DIAS.

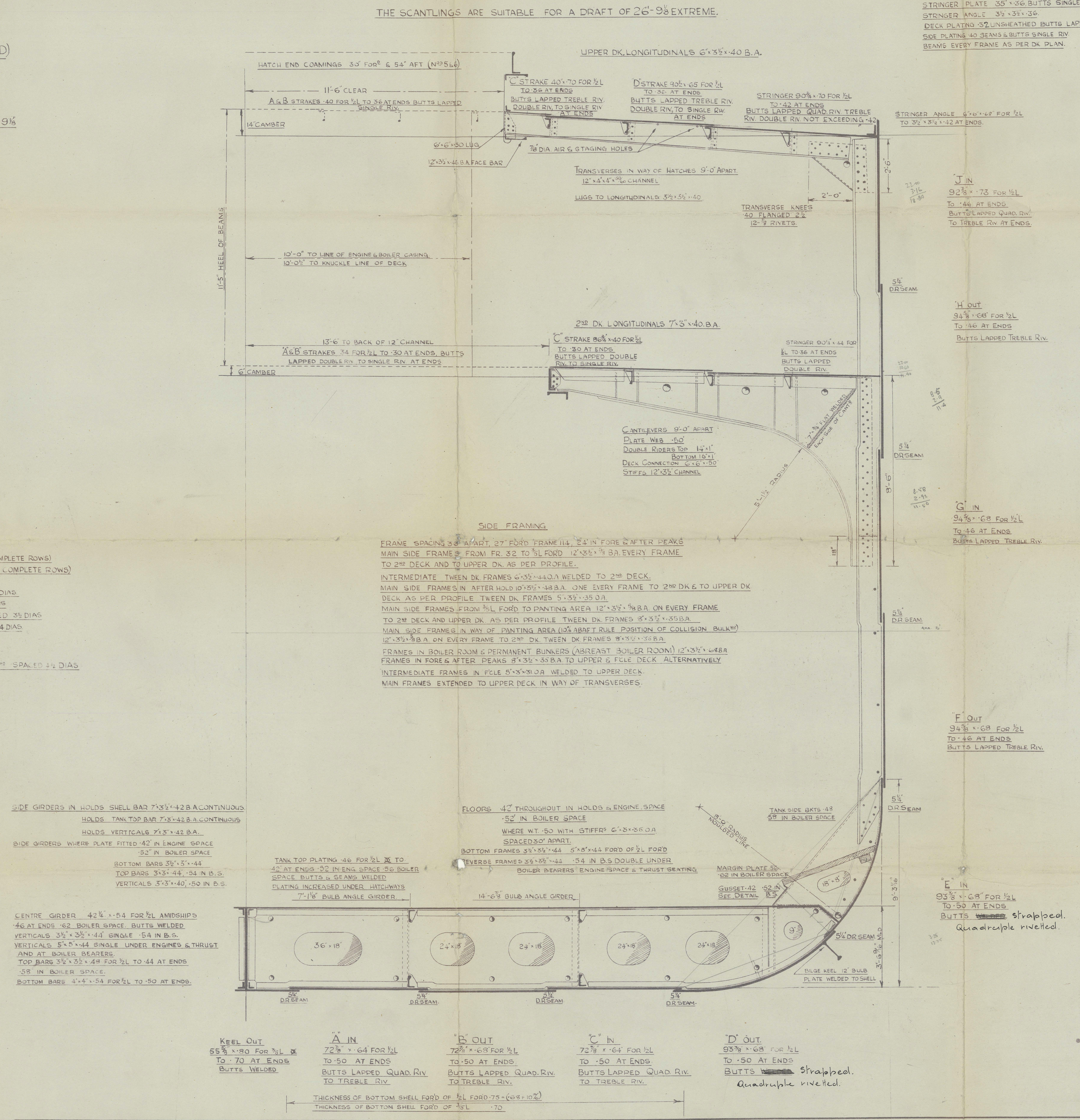
RIVETS IN CR. GIRDER TOP ANGLES (NON-WATERTIGHT) SPACED 7 DIAS.

RIVETS IN CR GIRDER TOP ANGLES (WATERTIGHT) SPACED 5 DIAS

NOTE:- THE SCANTLINGS OF ANGLE AND BULB ANGLE SECTIONS GIVEN ON THIS PLAN ARE N.B.S

MESSRS BARTRAM & SONS LTD.
SHIPBUILDERS
SUNDERLAND
YARD NO 304

FORECASTLE
STRINGER PLATE 35" × ·36, BUTTS SINGLE RIV.
STRINGER ANGLE 3½" × 3½" × ·36.
DECK PLATING ·32 UNSHEATHED BUTTS LAPPED SINGLE RIV.
SIDE PLATING ·40 SEAMS & BUTTS SINGLE RIV.
BEAMS EVERY FRAME AS PER DK. PLAN.



THE SCANTLINGS ARE SUITABLE FOR A DRAFT OF 26'-9⅛" EXTREME.

SIDE FRAMING

FRAME SPACING 30" APART, 27" FORD FRAME 114, 24" IN FORE & AFTER PEAKS
MAIN SIDE FRAMES FROM FR. 32 TO ⅗L FORD 12" × 3½" × 5/8 B.A. EVERY FRAME
TO 2ND DECK AND TO UPPER DK. AS PER PROFILE.
INTERMEDIATE TWEEN DK. FRAMES 6" × 3½" × ·44 O.A. WELDED TO 2ND DECK.
MAIN SIDE FRAMES IN AFTER HOLD 10" × 3½" × ·48 B.A. ONE EVERY FRAME TO 2ND DK & TO UPPER DK.
DECK AS PER PROFILE TWEEN DK FRAMES 5" × 3½" × ·35 O.A.
MAIN SIDE FRAMES FROM ⅗L FORD TO PANTING AREA 12" × 3½" × 5/8 B.A. ON EVERY FRAME
TO 2ND DECK AND UPPER DK. AS PER PROFILE TWEEN DK. FRAMES 8" × 3½" × ·35 B.A.
MAIN SIDE FRAMES IN WAY OF PANTING AREA (10% ABAFT RULE POSITION OF COLLISION BULKHD)
12" × 3½" × 5/8 B.A. ON EVERY FRAME TO 2ND DK. TWEEN DK FRAMES 8" × 3½" × ·35 B.A.
FRAMES IN BOILER ROOM & PERMANENT BUNKERS (ABREAST BOILER ROOM) 12" × 3½" × ·68 B.A.
FRAMES IN FORE & AFTER PEAKS 8" × 3½" × ·35 B.A. TO UPPER & F'CLE DECK ALTERNATIVELY
INTERMEDIATE FRAMES IN F'CLE 5" × 3" × ·31 O.A. WELDED TO UPPER DECK.
MAIN FRAMES EXTENDED TO UPPER DECK IN WAY OF TRANSVERSES.

SIDE GIRDERS IN HOLDS SHELL BAR 7" × 3½" × ·42 B.A. CONTINUOUS.
HOLDS TANK TOP BAR 7" × 3" × ·42 B.A. CONTINUOUS
HOLDS VERTICALS 7" × 3" × ·42 B.A.
SIDE GIRDERS WHERE PLATE FITTED ·42" IN ENGINE SPACE
·52" IN BOILER SPACE
BOTTOM BARS 3½" × 3" × ·44
TOP BARS 3" × 3" × ·44, ·54 IN B.S.
VERTICALS 3" × 3" × ·40, ·50 IN B.S.

CENTRE GIRDER 42¼" × ·54 FOR ½L AMIDSHIPS
·46 AT ENDS ·62 BOILER SPACE. BUTTS WELDED
VERTICALS 3½" × 3½" × ·44" SINGLE ·54 IN B.S.
VERTICALS 5" × 5" × ·44 SINGLE UNDER ENGINES & THRUST
AND AT BOILER BEARERS.
TOP BARS 3½" × 3½" × ·48 FOR ½L TO ·44 AT ENDS
·58" IN BOILER SPACE.
BOTTOM BARS 4" × 4" × ·54 FOR ½L TO ·50 AT ENDS.

TANK TOP PLATING ·46 FOR ½L ~~X~~ TO
·42" AT ENDS ·52 IN ENG. SPACE ·56 BOILER
SPACE BUTTS & SEAMS WELDED
PLATING INCREASED UNDER HATCHWAYS

FLOORS ·42" THROUGHOUT IN HOLDS & ENGINE SPACE
·52" IN BOILER SPACE
WHERE W.T. ·50 WITH STIFFRS 6" × 3" × ·35 O.A.
SPACED 30" APART.
BOTTOM FRAMES 3½" × 3½" × ·44 5" × 3" × ·44 FOR'D OF ½L FOR'D
REVERSE FRAMES 3½" × 3½" × ·44 ·54 IN B.S. DOUBLE UNDER
BOILER BEARERS ENGINE SPACE & THRUST SEATING.

CANTILEVERS 9'-0" APART
PLATE WEB ·50"
DOUBLE RIDERS TOP 14" × 1"
BOTTOM 16" × 1"
DECK CONNECTION 6" × 6" × ·50
STIFFS 12" × 3½" CHANNEL

TRANSVERSES IN WAY OF HATCHES 9'-0" APART.
12" × 4" × 4" × 50/60 CHANNEL
LUGS TO LONGITUDINALS 3½ × 3½" × ·40

TRANSVERSE KNEES
·40 FLANGED 2½"
12 - 7/8 RIVETS.

"C" STRAKE 40" × ·70 FOR ½L
TO ·36 AT ENDS
BUTTS LAPPED TREBLE RIV.
DOUBLE RIV. TO SINGLE RIV
AT ENDS

"D" STRAKE 90½" × ·65 FOR ½L
TO ·36 AT ENDS
BUTTS LAPPED TREBLE RIV.
DOUBLE RIV. TO SINGLE RIV.
AT ENDS

STRINGER 90¾" × ·70 FOR ½L
TO ·42 AT ENDS
BUTTS LAPPED QUAD. RIV. TREBLE
RIV. DOUBLE RIV. NOT EXCEEDING ·42

STRINGER ANGLE 6" × 6" × ·68" FOR ½L
TO 3½" × 3½" × ·42 AT ENDS.

A & B STRAKES ·40 FOR ½L TO ·36 AT ENDS BUTTS LAPPED
SINGLE RIV.

"A" & "B" STRAKES ·34 FOR ½L TO ·30 AT ENDS, BUTTS
LAPPED DOUBLE RIV. TO SINGLE RIV. AT ENDS.

"C" STRAKE 86¾" × ·40 FOR ½L
TO ·30 AT ENDS
BUTTS LAPPED DOUBLE
RIV. TO SINGLE RIV.

STRINGER 90¼" × ·44 FOR
½L TO ·36 AT ENDS
BUTTS LAPPED
DOUBLE RIV.

"J" IN
92⅞" × ·73 FOR ½L
TO ·46 AT ENDS
BUTTS LAPPED QUAD. RIV.
TO TREBLE RIV. AT ENDS.

"H" OUT
94⅝" × ·68" FOR ½L
TO ·46 AT ENDS
BUTTS LAPPED TREBLE RIV.

"G" IN
94⅝ × ·68 FOR ½"L
TO ·46 AT ENDS
BUTTS LAPPED TREBLE RIV.

"F" OUT
94⅝" × ·68 FOR ½L
TO ·46 AT ENDS
BUTTS LAPPED TREBLE RIV.

"E" IN
93⅜" × ·68" FOR ½L
TO ·50 AT ENDS
BUTTS ~~WELDED~~ strapped.
Quadruple rivetted.

KEEL OUT
55⅝" × ·80 FOR ⅗L ~~X~~
TO ·70 AT ENDS
BUTTS WELDED

"A" IN
72⅞" × ·64" FOR ½L
TO ·50 AT ENDS
BUTTS LAPPED QUAD. RIV
TO TREBLE RIV

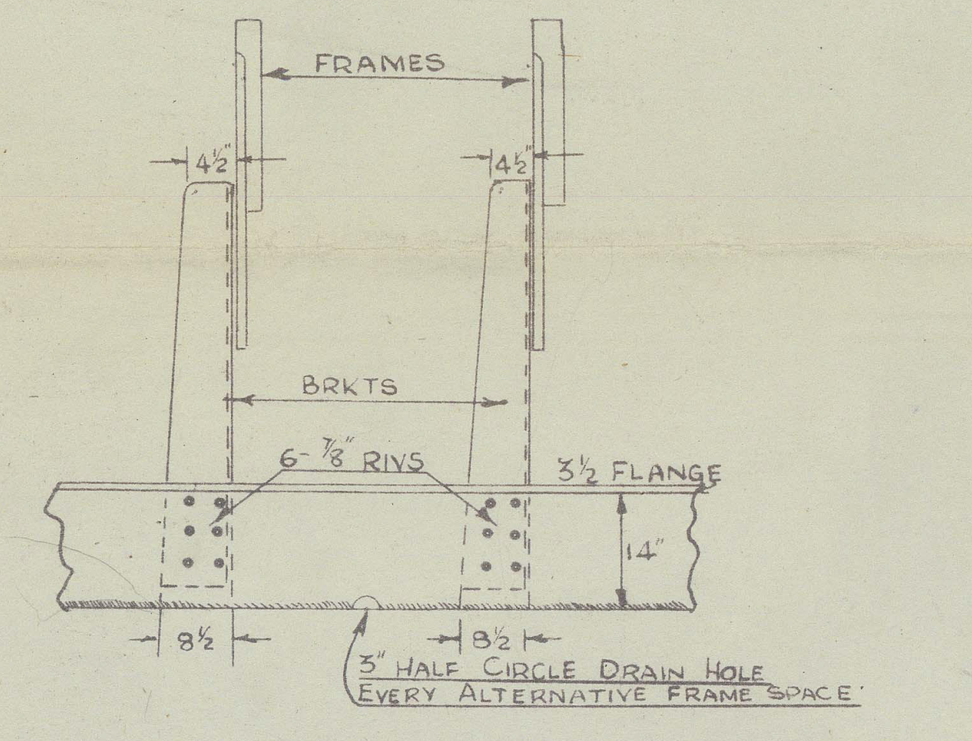
"B" OUT
72⅞" × ·68" FOR ½L
TO ·50 AT ENDS.
BUTTS LAPPED QUAD. RIV.
TO TREBLE RIV.

"C" IN
72⅞" × ·64" FOR ½L
TO ·50 AT ENDS.
BUTTS LAPPED QUAD. RIV.
TO TREBLE RIV.

"D" OUT.
93⅜" × ·68" FOR ½L
TO ·50 AT ENDS
BUTTS ~~WELDED~~ Strapped.
Quadruple rivetted.

THICKNESS OF BOTTOM SHELL FOR'D OF ½L FOR'D ·75 = (·68 + 10%)
THICKNESS OF BOTTOM SHELL FOR'D OF ⅗L ·70

UPPER DK. LONGITUDINALS 6" × 3½" × ·40 B.A.
HATCH END COAMINGS 30" FORD & 54" AFT (NOS 5 & 6)
11'-6" CLEAR
14" CAMBER
6" × 6" × ·50 LUG.
12" × 3½" × ·46 B.A. FACE BAR
7/8" DIA. AIR & STAGING HOLES
2'-6"
2'-0"
11'-5" HEEL OF BEAMS
10'-0" TO LINE OF ENGINE & BOILER CASING.
10'-0½" TO KNUCKLE LINE OF DECK
5¼" D.R SEAM.
22·00
3·16
18·84
2ND DK. LONGITUDINALS 7" × 3" × ·40 B.A.
13'-6" TO BACK OF 12" CHANNEL
6" CAMBER
22·00
10·60
11·40
8·5
2·9
11·4
7" × ¾" FLAT WELDED EACH SIDE OF CANTR
5'-1½" RADIUS
8'-6"
8·58
2·92
11·50
18"
ANA. 16'.
7'-1⅛" BULB ANGLE GIRDER.
14'-6⅞" BULB ANGLE GIRDER
36" × 18"
24" × 18"
9"
18" × 8"
8'-0" RADIUS MOULDED LINE
TANK SIDE BKTS ·48
·58 IN BOILER SPACE
MARGIN PLATE ·56
·62 IN BOILER SPACE
GUSSET ·42 ·52 IN B.S.
SEE DETAIL
5¼" D.R. SEAM.
9'-3 1/16"
3'-6 9/16" MLD
BILGE KEEL 12" BULB
PLATE WELDED TO SHELL
3·25
12·75



FRAMES
4½"
BRKTS
6 - 7/8" RIVS
3½ FLANGE
14"
8½
3" HALF CIRCLE DRAIN HOLE
EVERY ALTERNATIVE FRAME SPACE

DETAIL OF GUSSET PLATE.

20440
18590
1850

BARTRAM & SONS LIMITED
DRAWING OFFICE
DATE 29.10.45
NO. 153.
SUNDERLAND

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015213-015223-0209

CH

As
Ait.

Bartram & Sons Ltd,
Slip No 301. P.F. ("C") Type.
Sternframe.

Yard Nos 301-2-3-4

SUNDERLAND RPT. NO. 34144
Empire Mauritius

SUNDERLAND RPT. NO. 34207
'Empire Aden'

SUNDERLAND RPT. NO. 34323.
Empire Tobago.

'GRYFEVALE'

Coolbreagh Hill

N.N. "GRYFEVALE"

015213-015223-0210

P. F. "C" TYPE VESSEL. FABRICATED STERNFRAME.

LLOYD'S REGISTER OF SHIPPING LONDON
12 JAN 1944

A. P. PALM 2" THICK.
AFT FACE IS LINE OF FRAME 0
DIAGONAL LINES INDICATE CONTINUOUS 2" THICK WEB PLATE FROM AFT PERPENDICULAR TO FRAME 1.
RUDDER POST PLATES CUT AWAY GRADUALLY IN THIS DISTANCE.
DIAGONAL LINES INDICATE CONTINUOUS 1½" THICK WEB PLATE
FRAME 3 PALM. 1½" THICK
SECTION ON "C.C".
GUDGEON CUT FROM SOLID
RUDDER POST FROM 1½" THICK PLATES
NOSING FROM 5" DIA. ROUND (SOLID).
CONTRAGUIDE NOSING FROM 5/8" PLATE. "SET" TO FIT.
PROPELLER POST SIDEPLATES 1¼" THICK.
2 ROWS 1⅛" DIA. HOLES EACH SIDE. 5" PITCH CO.
FAIRWATER CUT FROM SOLID
HOLES IN BOSS FOR FIXING SHELL PLATES TO BE DRILLED BY SHIPBUILDERS.
RAKE OF SHAFT .2355" PER FOOT (SEE NOTES)
PROPELLER BOSS TUBE PLATES. 1¼" THICK.
FORWARD STIFFENING RING WELDED IN HALVES
3 ROWS 1⅛" DIA. HOLES EACH SIDE. 5" PITCH CO.
CONTRAGUIDE NOSING FROM 5/8" PLATE. "SET" TO STARBOARD
BUTT WELDED JOINT.
1½" BASEPLATE.
GUDGEON CUT FROM SOLID
BASE
1¼" DIA. DRAIN HOLE
ELEVATION ON STARBOARD SIDE.
SOLEPIECE CUT FROM SOLID.
SECTION ON "A.A".
FRAMES SPACED 24" APART
HOLES IN THIS PORTION OF FRAME TO BE DRILLED AT SHIPYARD.
℄ SHIP
SECTION AT FRAME 1. LOOKING FOR'D.
1¼" WRAPPER PLATES SPLIT HERE ONE SIDE DRESSED TO BOSS ONE SIDE FAIRED INTO 1¼" SIDEPLATES.
WELDS DRESSED FLUSH TO FORM SMOOTH LINE WITH 5" DIA. ROUND (SEE SECTIONS).
SECTION AT FRAME 0. LOOKING AFT.
1¼" PLATE. RUDDER POST
5/8" PLATE CONTRAGUIDE
DRAIN HOLES. 2" RAD.
SECTION AT 17'-3" WATER LINE.
SECTION AT 15'-3" WATER LINE.
SECTION AT 13'-3" WATER LINE.
SECTION AT 12'-0" WATER LINE.
SECTION AT 7'-0" WATER LINE.
SECTION AT 5'-0" WATER LINE.
SECTION AT 3'-0" WATER LINE.
SECTION THROUGH TOP AND BOTTOM GUDGEONS
SCALE - 1½" = 1'-0".
RUDDER STOCK AND PINTLE
LINE OF AFT PERP.
SECTION AT FRAME 2. LOOKING AFT.
SECTION AT FRAME 3. LOOKING AFT.
ELEVATION ON A.P. PALM LOOKING FOR'D.
6" DIA. ROUND SPLIT, AND WELDED (SEE PLAN AT 28'-0" W.L. BELOW).
2" THICK WEBS
PLAN AT 28'-0" WATER LINE.
5" DIA. ROUND BUTT WELDED HERE. 5" DIA. ROUND SPLIT AND SOLIDLY WELDED TO 2" CONTINUOUS WEB.
SECTION AT 20'-0" WATER LINE.
SECTION AT 8'-9" WATER LINE.
FAIRWATER NOSING WELL ROUNDED OFF.
SECTION AT FRAME 4. LOOKING AFT.
SECTION AT FRAME 5. LOOKING AFT.
SECTION AT 3" AFT OF FRAME 6.
DRAIN HOLE. 2" RAD.
12½" × 1¼" PLATE × 1'-3" LONG.
0.70" NOTCH IN FWD. END OF FRAME. SEE ELEVATION.
SCALE ¾" = 1'-0"

GENERAL NOTES

PROPELLER BOSS NOT PARALLEL TO BASE LINE. FINISHED RAKE OF SHAFT .2355" PER FOOT OBTAINED BY MACHINING AT SHIPYARD.

ALL TO LLOYDS OR BRIT. CORP'N. TESTS AND REQUIREMENTS.

ALL WELDS TO BE FULL STRENGTH AND CONTINUOUS.

EXTERIOR WELDS TO BE GROUND SMOOTH.

W.J.
12.1.44

5-1-44
302

PLAN Nº	P.F(C) 33.
DEPARTMENT	ADMIRALTY D.M.B.
DATE	MAY 20TH. 1943.

APPROVED BY LLOYDS ..... MAY 24TH. 1943.
APPROVED BY BRIT. CORP'N. ..... MAY 25TH. 1943.

015213-015227-0216
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"Empire Aden"

N.N. "ETIVEBANK"

Sternframe

Bartram & Sons.

Yards 303 4 & 5

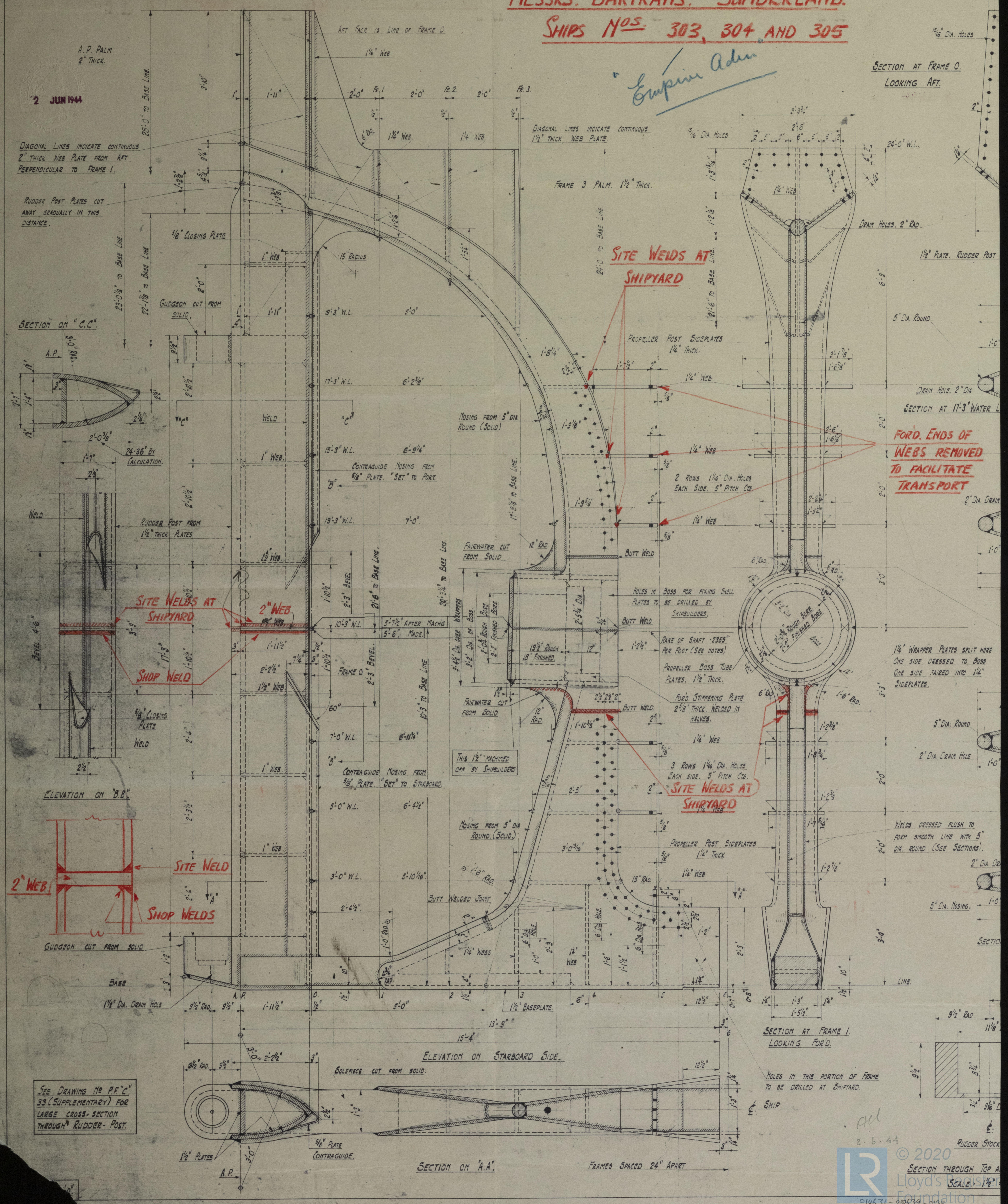
010631-010639-0138

P. F. "C" TYPE VESSEL. FABRICATED STERNFRAME.

MESSRS. BARTRAMS. SUNDERLAND.
SHIPS Nos 303, 304 AND 305

"Empire Aden"

2 JUN 1944


AFT FACE IS LINE OF FRAME 0
A.P. PALM 2" THICK.
1¼" WEB
FR. 1
FR. 2.
FR. 3.
25'-0" TO BASE LINE.
DIAGONAL LINES INDICATE CONTINUOUS 2" THICK WEB PLATE FROM AFT PERPENDICULAR TO FRAME 1.
DIAGONAL LINES INDICATE CONTINUOUS 1½" THICK WEB PLATE.
FRAME 3 PALM. 1½" THICK.
RUDDER POST PLATES CUT AWAY GRADUALLY IN THIS DISTANCE.
5/8" CLOSING PLATE
1" WEB
15" RADIUS.
23'-0⅛" TO BASE LINE.
22'-1⅞" TO BASE LINE
GUDGEON CUT FROM SOLID.
SECTION ON "C.C".
A.P.
3'-0" RAD.
24-36" BY CALCULATION.
19'-3" W.L.
17'-3" W.L.
15'-3" W.L.
13'-3" W.L.
10'-3" W.L.
7'-0" W.L.
5'-0" W.L.
3'-0" W.L.
WELD
NOSING FROM 5" DIA ROUND (SOLID)
CONTRAGUIDE NOSING FROM 5/8" PLATE. "SET" TO PORT.
CONTRAGUIDE NOSING FROM 5/8" PLATE. "SET" TO STARBOARD.
RUDDER POST FROM 1½" THICK PLATES
SITE WELDS AT SHIPYARD
2" WEB
SHOP WELD
5/8" CLOSING PLATE
ELEVATION ON "B.B".
SITE WELD
SHOP WELDS
GUDGEON CUT FROM SOLID
FAIRWATER CUT FROM SOLID
BUTT WELD
HOLES IN BOSS FOR FIXING SHELL PLATES TO BE DRILLED BY SHIPBUILDERS.
RAKE OF SHAFT ·2355" PER FOOT (SEE NOTES)
PROPELLER BOSS TUBE PLATES. 1½" THICK.
FOR'D. STIFFENING PLATE 2⅝" THICK. WELDED IN HALVES.
19½" ROUGH 18" FINISHED
5'-7½" AFTER MACH'G
5'-6" MACH'D.
3'-4½" DIA. OVER WRAPPERS
3'-2" DIA. OF BOSS.
2'-0¾" ROUGH BORE
2'-2" FINISHED BORE
THIS 1½" MACHINED OFF BY SHIPBUILDERS
PROPELLER POST SIDEPLATES 1¼" THICK.
2 ROWS 1 1/16" DIA. HOLES EACH SIDE. 5" PITCH CTS.
3 ROWS 1 1/16" DIA. HOLES EACH SIDE. 5" PITCH CTS.
SITE WELDS AT SHIPYARD
BUTT WELDED JOINT
1¼" WEBS
6" DIA. HOLE.
BASE
1⅛" DIA. DRAIN HOLE
1½" BASEPLATE.
13'-9"
15'-4"
ELEVATION ON STARBOARD SIDE.
SOLEPIECE CUT FROM SOLID.
1½" PLATES
5/8" PLATE CONTRAGUIDE.
SECTION ON "A.A".
FRAMES SPACED 24" APART
℄ SHIP
HOLES IN THIS PORTION OF FRAME TO BE DRILLED AT SHIPYARD.
SECTION AT FRAME 1. LOOKING FOR'D.
SECTION AT FRAME 0. LOOKING AFT.
15/16" DIA. HOLES
24'-0" W.L.
DRAIN HOLES. 2" RAD.
1½" PLATE. RUDDER POST
5" DIA. ROUND.
DRAIN HOLE. 2" DIA
SECTION AT 17-3" WATER L
FOR'D. ENDS OF WEBS REMOVED TO FACILITATE TRANSPORT
1¼" WRAPPER PLATES SPLIT HERE ONE SIDE DRESSED TO BOSS ONE SIDE FAIRED INTO 1¼" SIDEPLATES.
5" DIA. ROUND
2" DIA. DRAIN HOLE
WELDS DRESSED FLUSH TO FORM SMOOTH LINE WITH 5" DIA. ROUND. (SEE SECTIONS).
5" DIA. NOSING.
LINE.
9½" RAD.
RUDDER STOCK
SECTION THROUGH TOP A
SCALE. 1½"

SEE DRAWING No P.F."C" 33 (SUPPLEMENTARY) FOR LARGE CROSS-SECTION THROUGH RUDDER-POST.

AH
2.6.44

010631-010639-0138

7

Bartram & Sons Ltd

Ship No 301. P.F ("C") Type

Rudder Plan.

Yard Nos 301-2-3-4

SUNDERLAND RPT. NO. 34144

Empire Mauritius

SUNDERLAND RPT. NO. 34207

"Empire Aden"

SUNDERLAND RPT. NO. 34323

Empire Tobago.

N.N. "CROWBOROUGH HILL"

N.N. 'GRYFEVALE' X

[MARKAB]

015213-015223-0211.

P.F.(C) TYPE VESSEL. Nº 301.

RUDDER PLAN.

12 JAN 1944

SCALE :- 3/4" = 1 FOOT.

RUDDER.:-

TO LLOYD'S REQUIREMENTS.

LOAD DRAFT 26'-9", SHIPS SPEED 11 KNOTS.

AREA OF RUDDER (TO ℄ OF PINTLES) = A = 146 SQ. FT.

C.G. OF AREA ABAFT ℄ OF PINTLES = D = 3.96 FT.

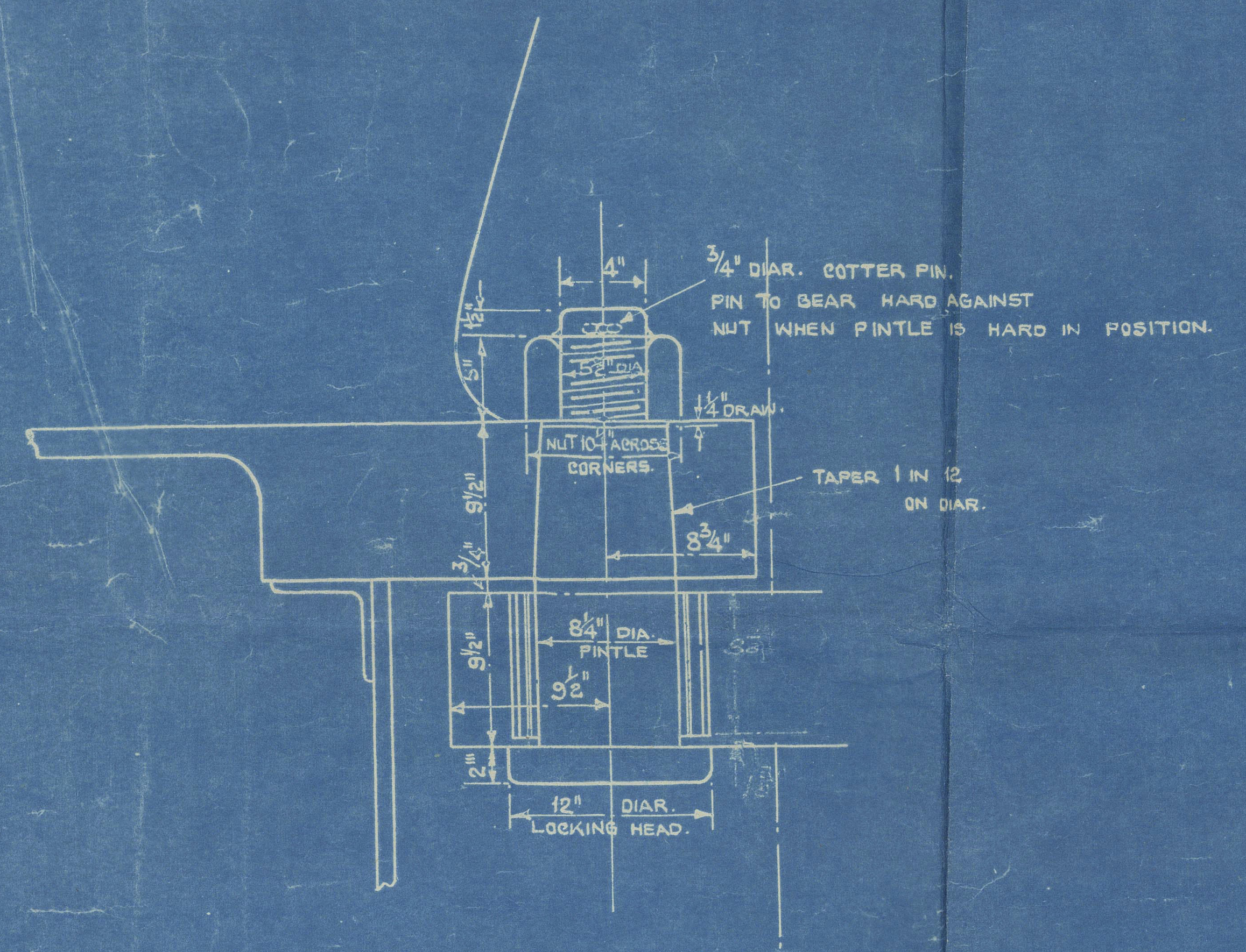
A × D = 578.

DIAR. OF RUDDER STOCK = 11" + 10% OF SECTIONAL AREA = 11 5/8".

RUDDER STOCK OF BEST FORGED STEEL.

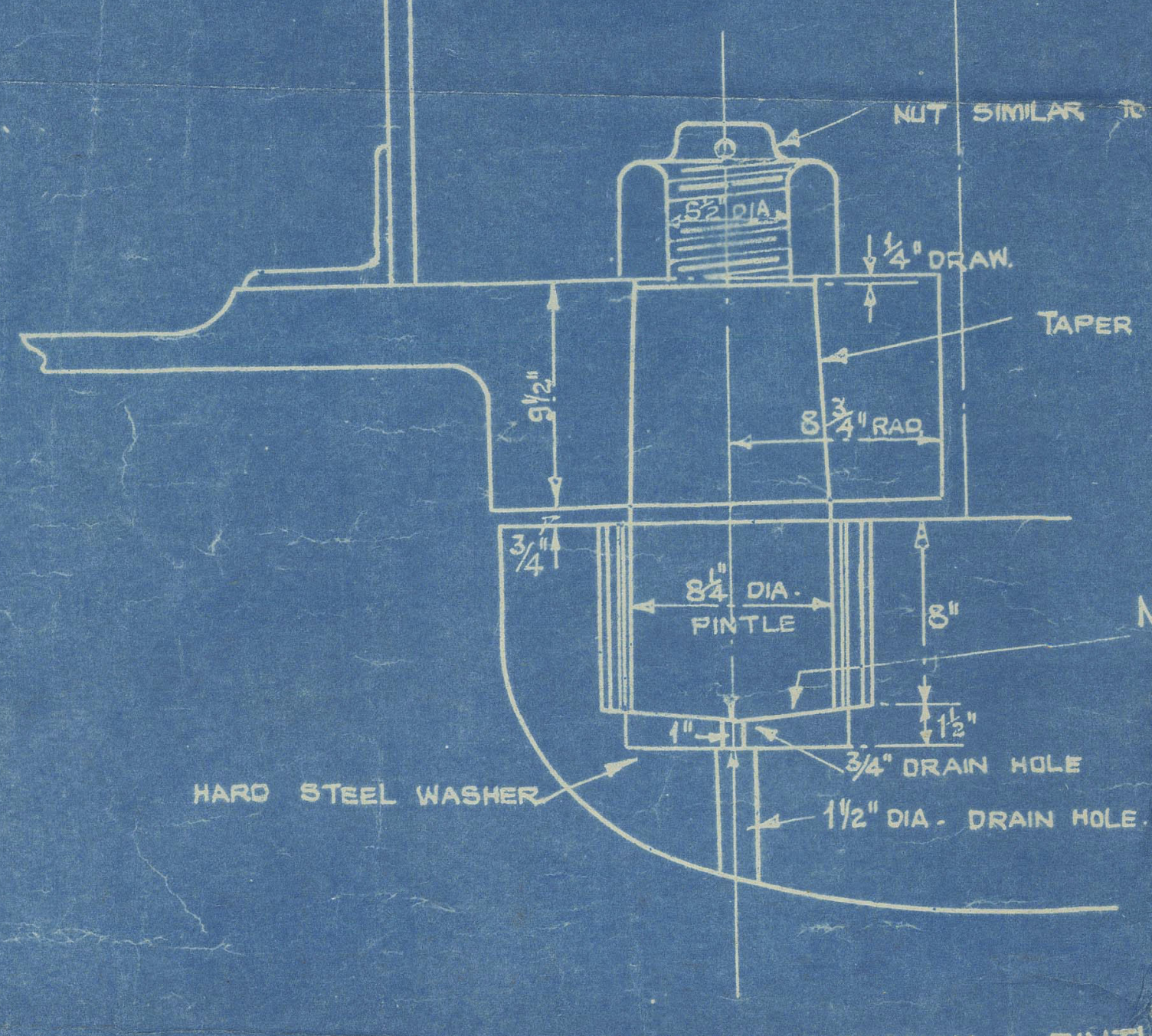
RUDDER CASTINGS OF STEEL.

RUDDER & RUDDER POST TO BE TESTED WITH BITUMINOUS SOLUTION.


3/4" DIAR. COTTER PIN.
PIN TO BEAR HARD AGAINST NUT WHEN PINTLE IS HARD IN POSITION.
4"
1/2"
5"
5 1/2" DIA
1/4" DRAW.
NUT 10" ACROSS CORNERS.
TAPER 1 IN 12 ON DIAR.
9 1/2"
8 3/4"
3/4"
8 1/4" DIA. PINTLE
9 1/2"
2"
12" DIAR. LOCKING HEAD.

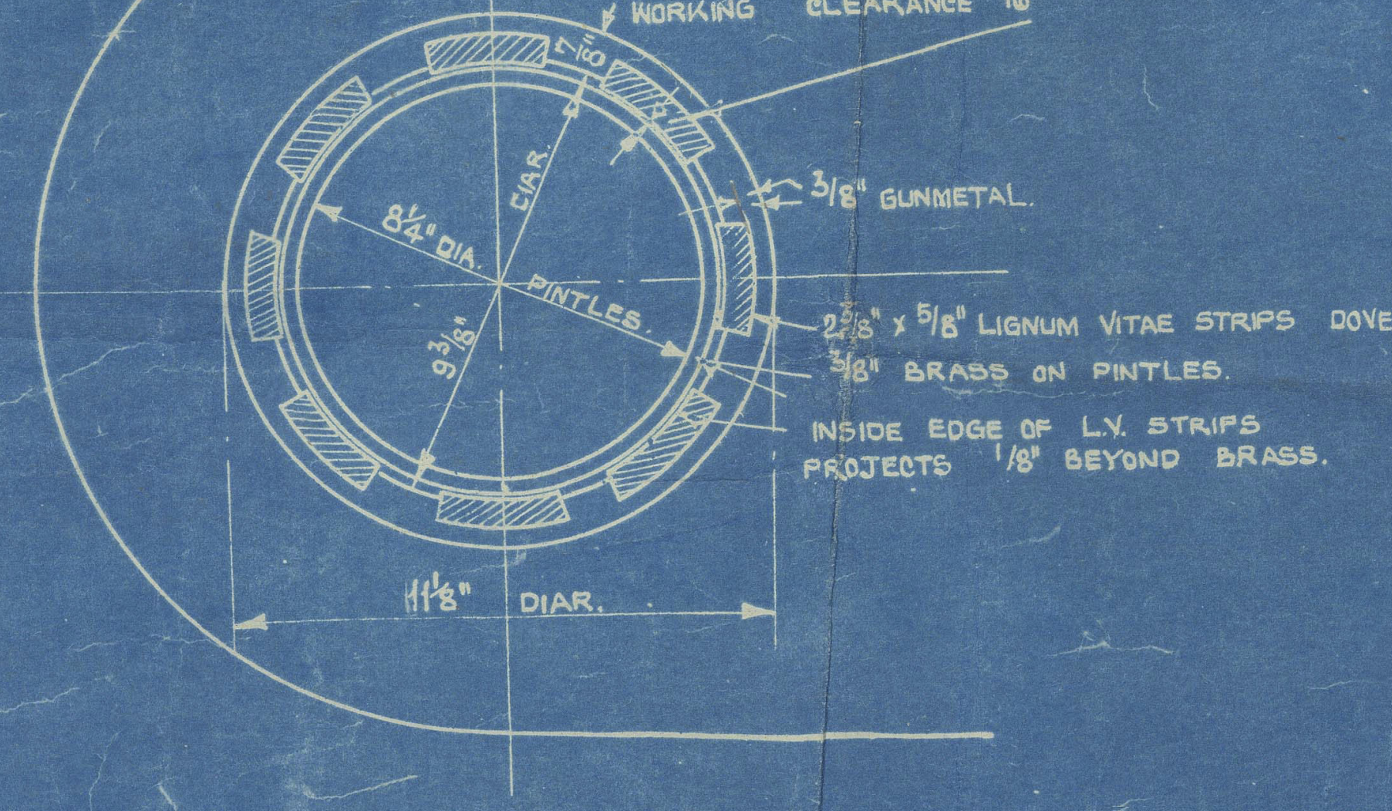
DETAIL OF TOP GUDGEON & PINTLE.
SCALE:- 1 1/2" = 1 FOOT.

NOTE:- PINTLES TO BE OF STEEL EFFICIENTLY "FITTED" AS SHOWN, BRASS BUSHES MUST BE TURNED IN ONE PIECE & PROPERLY SHRUNK ON.


NUT SIMILAR TO TOP PINTLE.
5 1/2" DIA.
1/4" DRAW.
TAPER 1 IN 12 ON DIAR. ON DIAR.
9 1/2"
8 3/4" RAD
3/4"
8 1/4" DIA. PINTLE
8"
1 1/2"
1"
3/4" DRAIN HOLE
1 1/2" DIA. DRAIN HOLE.
HARD STEEL WASHER

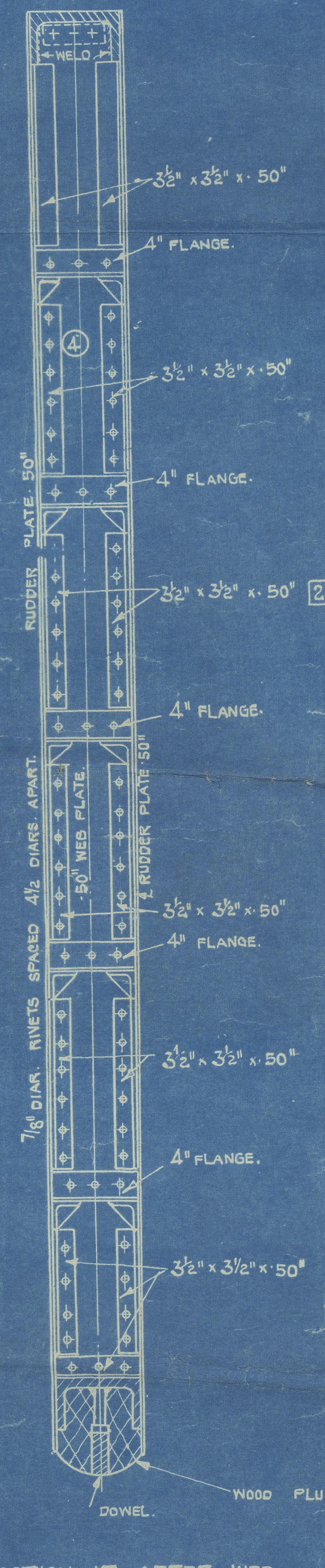
NOTE:- WHEN FLOATING RUDDER SLIGHT CLEARANCE TO BE LEFT BETWEEN BOTTOM ON BOTTOM PINTLE & STEEL WASHER TO ENSURE THAT CARRIER IS BEARING ENTIRE WEIGHT OF RUDDER.

DETAIL OF BOTTOM GUDGEON & PINTLE
SCALE:- 1 1/2" = 1 FOOT

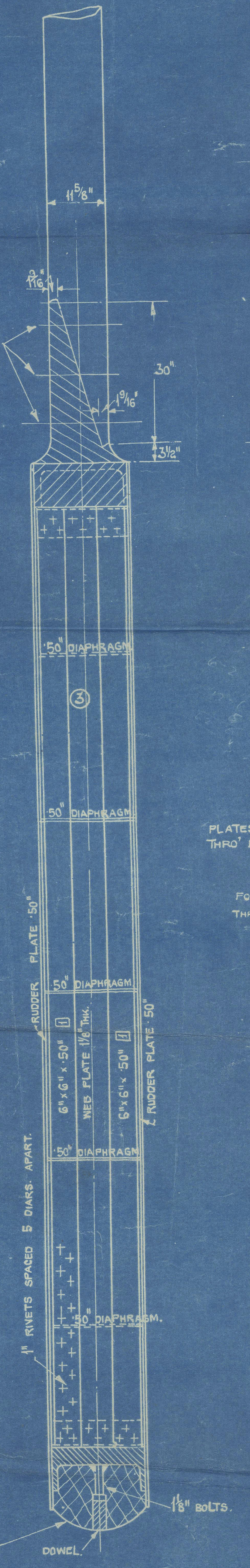

WORKING CLEARANCE 1/16"
7/16"
3/8" GUNMETAL.
2 7/8" x 5/8" LIGNUM VITAE STRIPS DOVETAILED IN
3/8" BRASS ON PINTLES.
INSIDE EDGE OF L.V. STRIPS PROJECTS 1/8" BEYOND BRASS.
8 1/4" DIA. PINTLES.
9 3/8" DIAR.
11 1/8" DIAR.

PLAN OF GUDGEONS.
SCALE:- 3" = 1 FOOT.

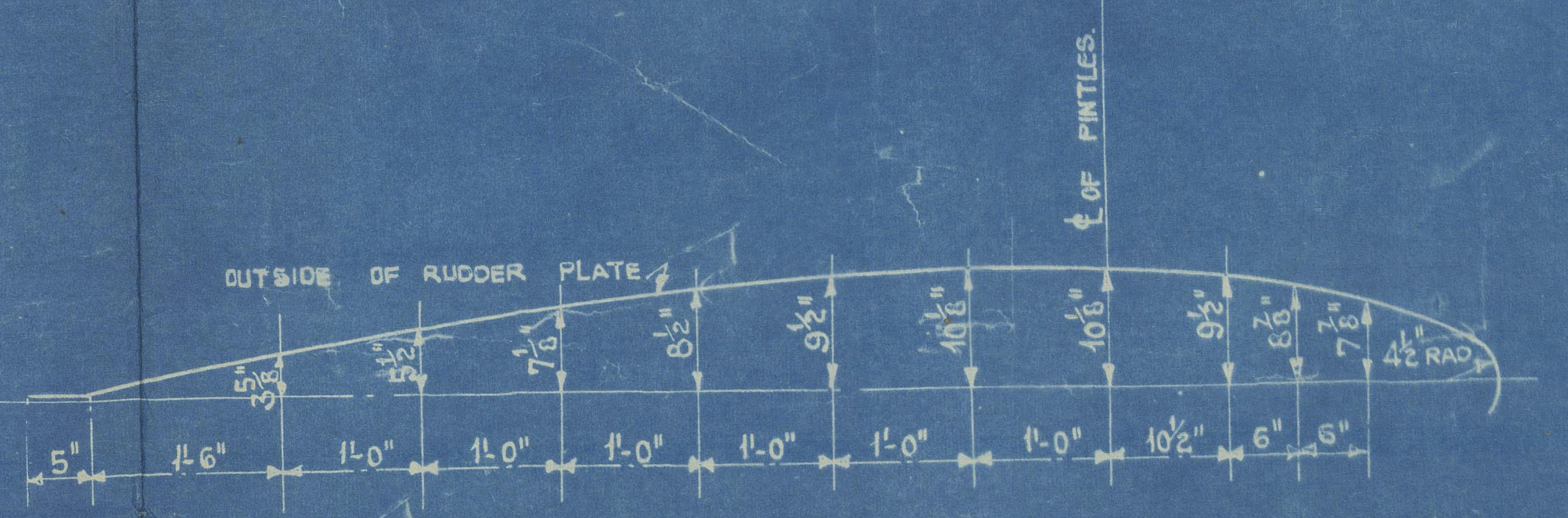
PLAN Nº	P.F.(C) 32
DEPARTMENT	ADMIRALTY D.M.B.
DATE	27TH APRIL 43.


WELD
3 1/2" x 3 1/2" x .50"
4" FLANGE.
4
3 1/2" x 3 1/2" x .50"
4" FLANGE.
RUDDER PLATE .50"
3 1/2" x 3 1/2" x .50" 2
4" FLANGE.
.50" WEB PLATE.
RUDDER PLATE .50"
3 1/2" x 3 1/2" x .50"
4" FLANGE.
7/8" DIAR. RIVETS SPACED 4 1/2 DIARS. APART.
3 1/2" x 3 1/2" x .50"
4" FLANGE.
3 1/2" x 3 1/2" x .50"
DOWEL.
WOOD PLUG.

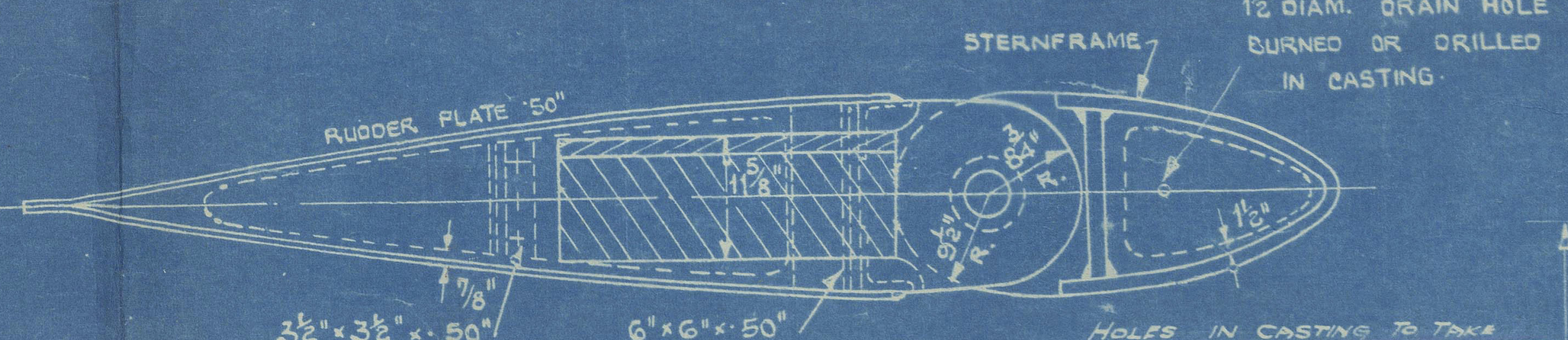
SECTION AT AFTER WEB.
LOOKING AFT.


11 5/8"
1 9/16"
8-3 1/4" DIAR. FITTED BOLTS
30"
1 9/16"
3 1/2"
.50" DIAPHRAGM
3
.50" DIAPHRAGM
RUDDER PLATE .50"
.50" DIAPHRAGM
6" x 6" x .50" 1
WEB PLATE 1 1/8" THK.
6" x 6" x .50" 1
RUDDER PLATE .50"
.50" DIAPHRAGM
1" RIVETS SPACED 5 DIARS. APART.
.50" DIAPHRAGM.
1 1/8" BOLTS.
DOWEL.

SECTION AT FOR'D WEB.
LOOKING AFT.


OUTSIDE OF RUDDER PLATE.
℄ OF PINTLES.
4 1/2" RAD
5"
1'-6"
1'-0"
1'-0"
1'-0"
1'-0"
1'-0"
1'-0"
10 1/2"
6"
6"

OFFSETS FOR RUDDER & RUDDER POST.

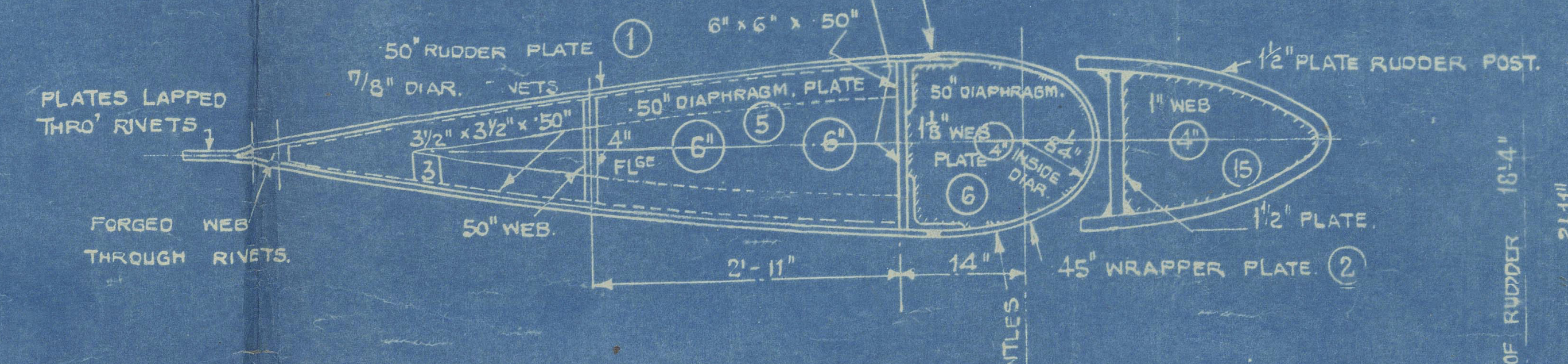

STERNFRAME
1 1/2" DIAM. DRAIN HOLE BURNED OR DRILLED IN CASTING.
RUDDER PLATE .50"
11 5/8"
8 3/4" R.
9 1/2" R.
1 1/2"
7/8"
3 1/2" x 3 1/2" x .50"
6" x 6" x .50"

HOLES IN CASTING TO TAKE SIDE PLATES TO BE DRILLED BY SHIPBDLR

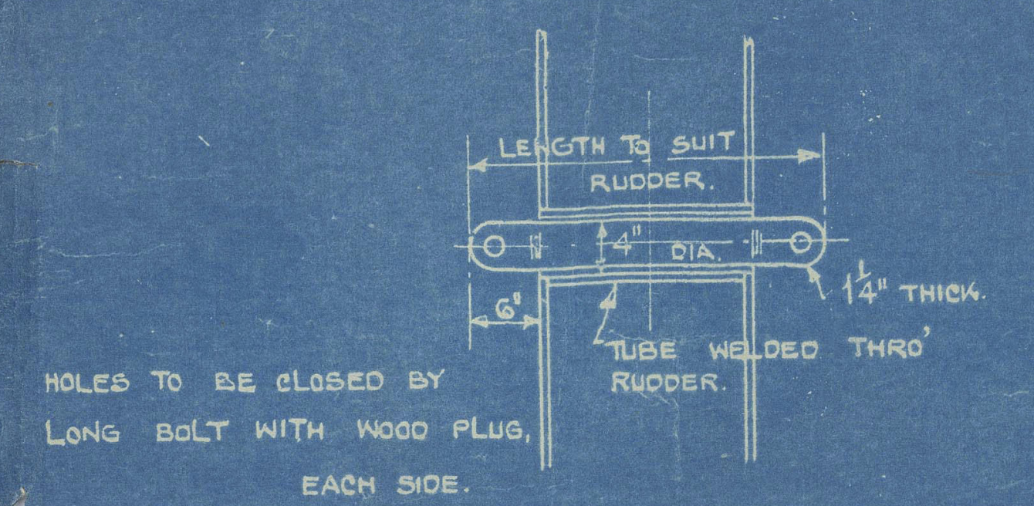
PLAN VIEW OF TOP CASTING.

THIS WEB PLATE IS CLOSING PLATE, FITTED AFTER RUDDER PLATES ARE RIVETED.

"VEED" WELD IN WAY OF WRAPPER PLATE FULL WELD CLEAR OF WRAPPER PLATE.

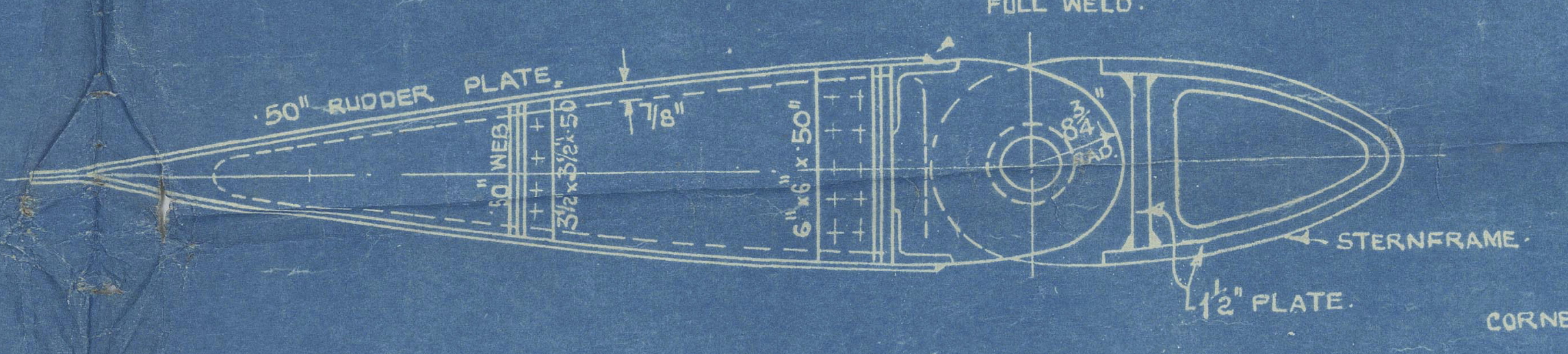

PLATES LAPPED THRO' RIVETS
FORGED WEB THROUGH RIVETS.
.50" RUDDER PLATE 1
7/8" DIAR. RIVETS
6" x 6" x .50"
3 1/2" x 3 1/2" x .50"
3
.50" DIAPHRAGM. PLATE
4" FLGE
6"
5
6"
50" WEB.
.50" DIAPHRAGM.
1 1/8" WEB PLATE
4"
8 1/4" INSIDE DIAR.
6
1 1/2" PLATE RUDDER POST.
1" WEB
4"
15
1 1/2" PLATE.
45" WRAPPER PLATE. 2
2'-11"
14"
℄ OF PINTLES

TYPICAL PLAN OF DIAPHRAGM


LENGTH TO SUIT RUDDER.
4" DIA.
6"
1 1/4" THICK.
TUBE WELDED THRO' RUDDER.

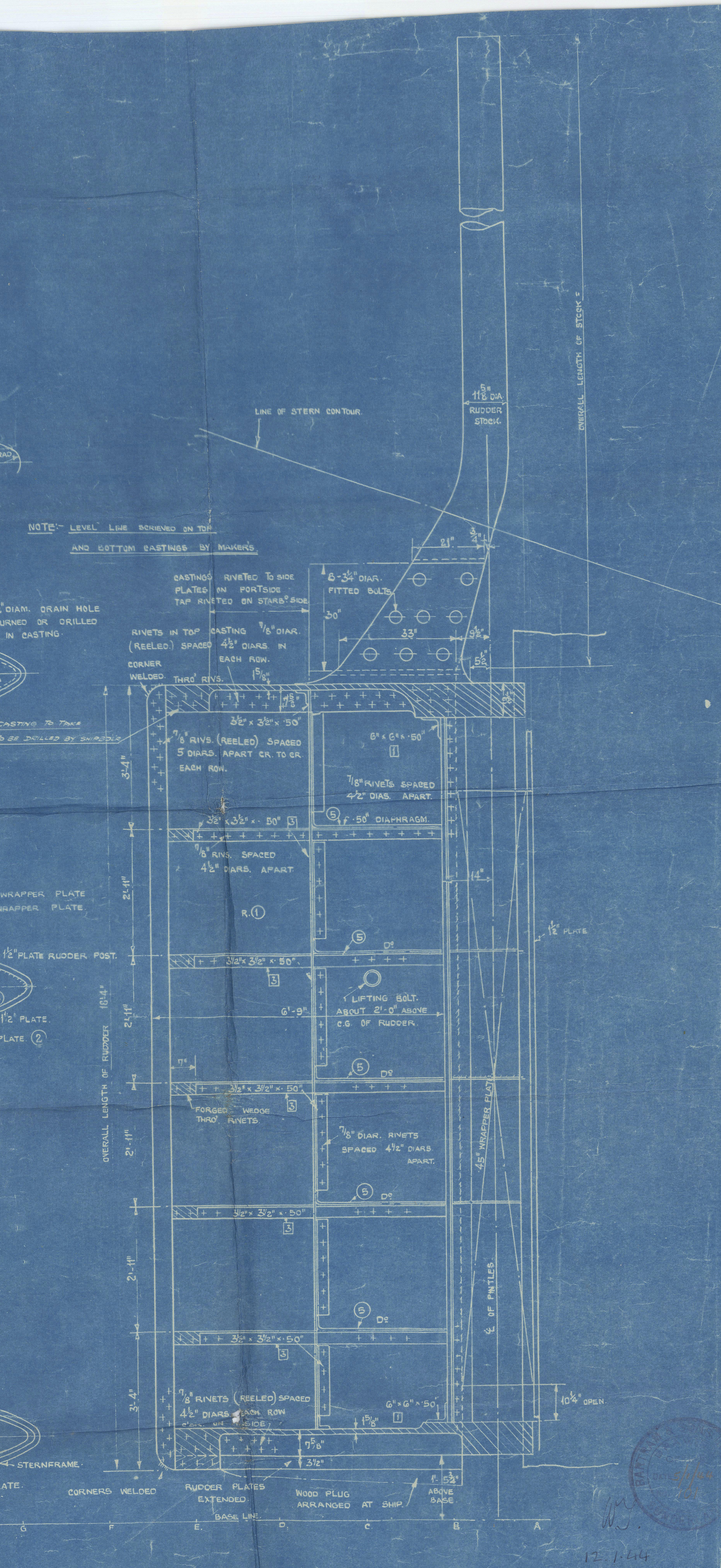
HOLES TO BE CLOSED BY LONG BOLT WITH WOOD PLUG, EACH SIDE.

DETAIL OF RUDDER LIFTING BOLT.


FULL WELD.
.50" RUDDER PLATE.
.50" WEB
3 1/2" x 3 1/2" x .50
7/8"
6" x 6" x .50"
8 3/4" RAD.
STERNFRAME.
1 1/2" PLATE.

PLAN VIEW OF LOWER CASTING.

NOTE:- LEVEL LINE SCRIEVED ON TOP AND BOTTOM CASTINGS BY MAKERS.


11 5/8" DIA. RUDDER STOCK.
OVERALL LENGTH OF STOCK
LINE OF STERN CONTOUR.
21"
3/4"
8-3/4" DIAR. FITTED BOLTS
30"
33"
9 1/2"
5 1/2"
CASTINGS RIVETED TO SIDE PLATES ON PORTSIDE TAP RIVETED ON STARB'D SIDE.
RIVETS IN TOP CASTING 7/8" DIAR. (REELED) SPACED 4 1/2" DIARS. IN EACH ROW.
CORNER WELDED.
THRO' RIVS.
1 5/8"
7/8"
3 1/2" x 3 1/2" x .50"
7/8" RIVS. (REELED) SPACED 5 DIARS. APART CR. TO CR. EACH ROW.
6" x 6" x .50" 1
7/8" RIVETS SPACED 4 1/2" DIAS. APART.
5 .50" DIAPHRAGM.
3 1/2" x 3 1/2" x .50" 3
7/8" RIVS. SPACED 4 1/2" DIARS. APART
14"
R. 1
1 1/2" PLATE
5 Dº
3 1/2" x 3 1/2" x .50"
3
LIFTING BOLT. ABOUT 2'-0" ABOVE C.G. OF RUDDER.
6'-9"
7"
5 Dº
3 1/2" x 3 1/2" x .50"
3
FORGED WEDGE THRO' RIVETS.
7/8" DIAR. RIVETS SPACED 4 1/2" DIARS. APART.
45" WRAPPER PLATE
5 Dº
3 1/2" x 3 1/2" x .50"
3
5 Dº
3 1/2" x 3 1/2" x .50"
3
℄ OF PINTLES
7/8" RIVETS (REELED) SPACED 4 1/2" DIARS. EACH ROW
6" x 6" x .50"
1
1 5/8"
7 5/8"
3 1/2"
10 1/4" OPEN.
1'-5 3/4" ABOVE BASE
OVERALL LENGTH OF RUDDER 16'-4"
3'-4"
2'-11"
2'-11"
2'-11"
2'-11"
3'-4"
CORNERS WELDED
RUDDER PLATES EXTENDED
WOOD PLUG ARRANGED AT SHIP.
BASE LINE.
G
F
E.
D.
C.
B.
A

BARTRAM & SONS 5/1/44 101

W.J.

12.1.44

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